

The American
Ship Building
△ **Company** △



Cleveland

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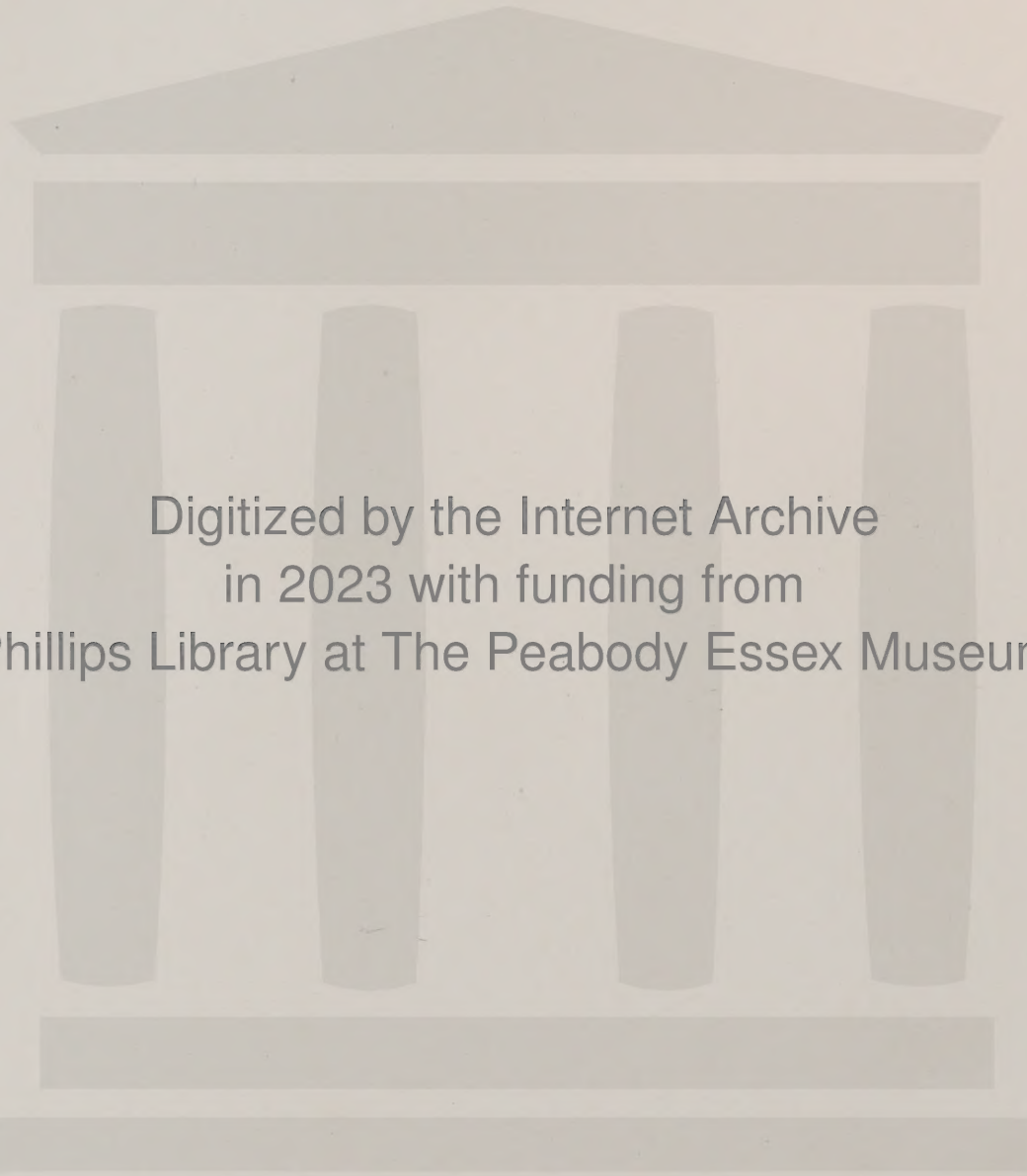


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The American
Ship Building Company
Ship Builders and Engineers



Designers and Builders of
Ships
Engines
Boilers
Auxiliary Machinery
Ship Fittings
and
Marine Hardware

General Offices:
Cleveland



**This Company has constructed a great
variety of vessels as shown
by the following:**

Coarse freight vessels.....	345
Package freight vessels.....	32
Passenger vessels.....	30
Bulk oil steamers.....	6
Bulk oil barges.....	11
Lake and ocean tugs.....	9
Fishing tugs.....	10
Coarse freight tow barges.....	24
Conveyor and fuel boats.....	6
Car ferry steamers.....	14
Fire tugs.....	4
Sandsuckers.....	3
Revenue cutters.....	3
Lighthouse tenders.....	4
Large steam yachts.....	3
Steam canal boat.....	1
Canal barges.....	7
Drill boat.....	1

Agents

Sole Agents for Isherwood System of Hull Construction
Builders of Ellis & Eaves Induced Draft
Sole Agents for Edwards Patent Air Pump
Sole Agents for Silley Smoke Box Door Fittings
Sole Agents for Brews Flue Blowers and Purifiers
Sole Agents for Lovekin Patent Assistant Cylinders

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1912

Introductory



THE special lines of ships, engines, boilers, machinery, ship fittings, marine and railroad hardware herein described is the practical result of many years of experience of this Company as ship builders and engineers.

In the following pages we have endeavored to set forth some of the many branches of our business. Each ship, boiler, engine or other article shown has been designed and built to meet some special requirement not ordinarily anticipated in general business lines.

In addition to all the work shown we are equipped for all kinds of commercial pattern, foundry, machine, boiler and forging work. We solicit pattern work for engines and machinery and can make castings of any size or shape in iron, semi-steel or brass. Engine work is a specialty, such as new parts, alignment of engine shafts, relining bearings, boring cylinders, etc. Another feature, which will be found well illustrated, is heavy or light forging for which a special plant has been built.

Boiler and tank work is another specialty, our boiler shops being well adapted to this kind of work, including which may be noted riveting and caulking, welding, new tubes or furnaces, patching plates, expanding tubes, tanks, light sheet iron work, steel smokestacks, rolling plates, bending angles or channels, galvanizing pans and kettles.

We will cheerfully give information regarding any of the work shown in this catalog and we would ask that inquirers note the following points when writing:

- 1st. Carefully consult catalog before ordering.
- 2nd. Always mention name, figure, number required and finish of each article.
- 3rd. Give full shipping directions; these not being given we are obliged to use our own judgment.
- 4th. Report immediately to the Company any imperfections or shortage.

Terms:—Net in thirty days, F. O. B. Cleveland, unless otherwise stated. Those not known to us and not rated commercially must remit with order or give satisfactory reference.

Prices given on application.



One of our Delivery Launches

All the work illustrated in these pages was constructed by The American Ship Building Co.



Plants of The American Ship Building Co.

American Ship Building Company, Cleveland, Ohio (Globe Plant)

Name of Plant: American Ship Building Co., Cleveland, O.,
Globe Plant.
Street: Foot of West 54th Street.
Railroad Connection: Erie R. R.
River: Cuyahoga.
Total Acreage: 18.75 acres.
Size of Foundry Building: 180 x 120 feet.
Number of Cupolas and Total Capacity: Three Cupolas,
18 tons per hour.
Size of Machine Shop Building: 100 x 120 feet.
Capacity of Largest Boring Mill: 10 feet diameter.
Capacity of Largest Planer: 8 x 16 feet.
Capacity of Largest Lathe: 9 feet 6 inches x 21 feet.
Capacity of Sheer Legs: 80 tons.

Capacity of Locomotive Crane: One 10-ton.
Capacity of Delivery Launch: One 10-ton and one ½-ton.
Capacity of Largest Truck or Motor Truck: One 5-ton and
one 1½-ton.
Number of Dry Docks: Three.
Dimensions of Docks:
No. 1 Dock, 547 feet over all, 65 feet at gate.
No. 2 Dock, 450 feet over all, 48 feet at gate.
No. 3 Dock, 360 feet over all, 50 feet at gate.
Number of Building Berths: Two.
Largest Boat which Berth will take: No limit.
Length of Rolls in Punch Shop: 19 feet.
Distance from Harbor or River Mouth to Yard: ½ mile.

American Ship Building Company, Lorain, Ohio

Name of Plant: American Ship Building Co., Lorain.
Street: Colorado Avenue.
Railroad Connection: N. Y. C. & St. L.
River: Black River.
Total Acreage: 43 acres.
Size of Machine Shop Building: 240 x 110 feet.
Capacity of Largest Boring Mill: 14 feet 2 inches diameter x
10 feet high.
Capacity of Largest Planer: 14 feet 2 inches wide x 25 feet
long x 10 feet 6 inches high.
Capacity of Largest Lathe: 5 feet 1 inch swing x 27 feet long,
also 6 feet 2 inches swing x 18 feet long.
Size of Boiler Shop Building: 200 x 110 feet.
Gap of Bull Riveter: 10 feet 6 inches.
Length of Plate that Can Be Rolled in Boiler Shop: 18 feet
6 inches.
Capacity of Sheer Legs: No. 1, 50 tons; No. 2, 90 tons.

Capacity of Locomotive Crane: Three Cranes, 10 tons each.
Capacity of Delivery Launch: Two Launches of 1 ton each.
Capacity of Largest Truck or Motor Truck: One 5-ton and
one 1½-ton.
Number of Dry Docks: Two.
Dimensions of Docks:
No. 1, Longest Boat dockable, 549 feet.
No. 2, Longest Boat dockable, 700 feet.
Number of Building Berths: Four.
Largest Boat that Berth will take:
No. 1, Longest Boat, 440 feet.
No. 2, Longest Boat, 552 feet.
No. 3, Longest Boat, 700 feet.
No. 4, Longest Boat, 700 feet.
Length of Rolls in Punch Shop: Three Rolls, 24 feet 2 inches,
18 feet 8 inches and 16 feet 6 inches.
Distance from Harbor or River Mouth to Yard: About
one mile.

Detroit Ship Building Company, Detroit, Mich.

Name of Plant: Detroit Ship Building Co.
Street: Foot of Orleans Street.
Railroad Connections:
Wyandotte—Michigan Central R. R., Detroit, Toledo &
Ironton R. R.
Detroit—New York Central and Michigan Central—
Grand Trunk.
River: Detroit River.
Total Acreage: 12.17 acres Detroit Plant, and 12.56 acres
Wyandotte Plant.
Size of Foundry Building: 75 x 152 feet.
Number of Cupolas and Total Capacity: One 48-inch and
one 72-inch. 10½ tons per hour.
Size of Machine Shop Building: 66 x 200 feet.
Capacity of Largest Boring Mill: 84 inches.

Capacity of Largest Planer: 16 x 16 ft., Wall Type; 6 ft. x
17 ft. 6 in. Ordinary Type.
Capacity of Largest Lathe: 10 feet x 25 feet.
Size of Boiler Shop Building: 120 feet x 185 feet 9 inches.
Gap of Bull Riveter in Boiler Shop: 130 inches.
Length of Plate that Can be Rolled: 14 feet 10 inches.
1⅝ inches thick.
Capacity of Sheer Legs: 75 tons.
Capacity of Largest Truck: 2-ton "Packard" Motor Truck.
Number of Dry Docks: One.
Dimensions of Dry Dock: Length on keel blocks, 368 feet;
Width, 92 feet; Depth over sill, 16 feet.
Number of Building Berths: Four at Wyandotte.
Largest Boat which Berth will take: 600 feet.
Length of Rolls in Punch Shop: 16 feet.
Both yards are situated right on Detroit River.

Buffalo Dry Dock Company, Buffalo, N. Y.

Name of Plant: Buffalo Dry Dock Co., Buffalo, N. Y.
Street: Ganson Street.
Railroad Connection: Buffalo Creek R. R.
River: Buffalo River.
Total Acreage: 15 acres.
Size of Machine Shop Building: 82 x 58 feet.
Capacity of Largest Planer: 42 x 42 inches x 16 feet.
Capacity of Largest Lathe: 62 inches x 26 feet.
Capacity of Sheer Legs: 84 tons.
Capacity of Locomotive Crane: 10 tons.

Capacity of Delivery Launch: 12 tons.
Capacity of Largest Truck or Motor: 5 tons.
Number of Dry Docks: Three.
Dimensions of Docks:
No. 1, 52 x 432 feet.
No. 2, 65 x 625 feet.
No. 3, 45 x 382 feet.
Number of Building Berths: One.
Largest Boat Berth will take: 402 feet.
Length of Rolls in Punch Shop: 18 feet 3 inches.
Distance from Harbor or River Mouth to Yard: 1½ miles.



Plants of The American Ship Building Co.

Chicago Ship Building Company, South Chicago, Ill.

Name of Plant: Chicago Ship Building Company.
 Street: 101st Street and Calumet River.
 Railroad Connections: Pennsylvania R. R. and Indiana Harbor Belt R. R.
 River: Calumet River.
 Total Acreage: 23½ acres.
 Size of Machine Shop Building: 40 x 121 feet.
 Capacity of Largest Boring Mill: 22 feet x 17 feet 2 inches x 14 feet swing.
 Capacity of Largest Planer: 6 feet x 20 feet 8 inches.
 Capacity of Largest Lathe: 5 feet swing x 35 feet 3 inches long.

Capacity of Sheer Legs: 100 tons.
 Capacity of Locomotive Crane: 10 tons.
 Capacity of Delivery Launch: 5 tons.
 Number of Dry Docks: Two.
 Dimensions of Dock: Concrete Dock, 700 feet over all; Wood Dock, 564 feet over all.
 Number of Building Berths: Two.
 Largest Boat which Berths will take: 600 feet.
 Length of Rolls in Punch Shop: 19 feet 6 inches between housings.
 Distance from Harbor or River Mouth to Yard: One mile.

Western Dry Dock & Ship Building Co., Ltd., Port Arthur, Ont., Canada

Name of Plant: Western Dry Dock & Ship Building Co.
 Street: Current River Park.
 Railroad Connection: C. P. R. R. and C. N. R.
 Lake: Lake Superior.
 Total Acreage: 100 acres.
 Size of Foundry Building: 65 x 120 feet.
 Number of Cupolas and Total Capacity: Two. 15 tons per hour.
 Size of Machine Shop Building: 90 x 180 feet.
 Capacity of Largest Boring Mill: About 16 feet.
 Capacity of Largest Planer: 10 x 20 feet.
 Capacity of Largest Lathe: 90 inches swing x 24 feet long.
 Size of Boiler Shop Building: 90 x 180 feet.
 Gap of Bull Riveter in Boiler Shop: 10 feet 6 inches.

Length of Plate that Can be Rolled: 12 feet. 1¾ inches thick.
 Capacity of Sheer Legs: 75 tons.
 Capacity of Locomotive Crane: Two 5-ton.
 Capacity of Delivery Launch: 45 feet long x 10 feet beam.
 Capacity of Largest Truck or Motor Truck: 3½-ton Motor Truck.
 Number of Dry Docks: One.
 Dimensions of Docks: 700 x 98 x 16 feet.
 Number of Building Berths: Two.
 Largest Boat which Berth will take: 700 feet.
 Length of Rolls in Punch Shop: 18 feet.
 Distance from Harbor or River Mouth to Yard: One mile from Port Arthur, 4½ miles from mouth of River Fort William.

The Superior Ship Building Company, Superior, Wis.

Name of Plant: Superior Ship Building Co.
 Street: Grand Avenue and 2nd Street.
 Railroad Connections: L. S. T. & T. Ry. Co.
 River: St. Louis River.
 Total Acreage: 38.07 acres.
 Size of Machine Shop Building: 149 x 80 feet.
 Capacity of Largest Boring Mill: 11 feet 6 inches.
 Capacity of Largest Planer: 6 x 10 feet.
 Capacity of Largest Lathe: 80 inches x 22 feet.
 Capacity of Locomotive Crane: 20 tons.
 Capacity of Delivery Launch: 3 tons.
 Capacity of Largest Truck or Motor Truck: 5 tons.

Number of Dry Docks: Two.
 Dimensions of Docks:
 Dock No. 1, 591 feet long, 14 feet over sill.
 Dock No. 2, 620 feet long, 19 feet over sill.
 Number of Building Berths: Two.
 Largest Boat which Berth will take: 600 feet.
 Length of Rolls in Punch Shop: 18 feet.
 Distance from Harbor or River Mouth to Yard: One-half mile.

NOTE. The Superior Ship Building Company also operates the Marine Repair Steamer "Robert J. Close" which is equipped to make repairs of every nature (save bottom work) to ships.

Milwaukee Dry Dock Company, Milwaukee, Wis.

Name of Plant: Milwaukee Dry Dock Co. Two Plants.
 Street: South Yard, Foot of Mineral Street; West Yard, 454 Canal Street.
 Railroad Connections: South Yard, C. & N.W. Ry.; West Yard, C. M. & St. Paul.
 River: South Yard, Kinnickinnic River; West Yard, Menominee River.
 Total Acreage: 12.16 acres.
 Size of Machine Shop Building: 40 x 60 feet, brick.
 Capacity of Largest Planer: 36 inches wide x 12 feet long.
 Capacity of Largest Lathe: 54 inches swing x 20 feet long.
 Capacity of Sheer Legs: Two derricks, 15 to 20 tons each.

Capacity of Delivery Launch: 4 tons.
 Capacity of Largest Truck or Motor Truck: 4 tons.
 Number of Dry Docks: Two.
 Dimensions of Docks: South Dock, 454 feet over all, 61 feet at gate, 13 feet 6 inches over sill. West Dock, 312 feet over all, 45 feet at gate, 13 feet over sill.
 Number of Building Berths: Three.
 Largest Boat which Berth will take: About 400 feet.
 Length of Rolls in Punch Shop: 16-foot plate.
 Distance from Harbor or River Mouth to Yard: South Dock, ¼ mile; West Dock, about 1 mile.



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Steamer "Seeandbee"

The largest side-wheel passenger boat on fresh
or salt water

Length over all	-	-	-	-	-	-	-	500'
Length on keel	-	-	-	-	-	-	-	485'
Beam over hull	-	-	-	-	-	-	-	58'
Beam over guards	-	-	-	-	-	-	-	96' 6"
Depth	-	-	-	-	-	-	-	22' 10"

NOWHERE else in the world has the side-wheel steamer been developed to the point that has been reached on the Great Lakes. Here are found a large number of vessels of this type devoted to the passenger and freight interests. It can readily be seen that where paddle wheels are used, very much wider decks are made necessary to properly house in these wheels, thereby increasing the freight capacity as well as the number of staterooms. Another favorable feature is that side-wheel steamers are easier riding in a seaway because the wheels exert a steady effect upon the boat.



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Steamer "Seeandbee"

THE illustration above shows a steamer which embodies the best and latest in modern marine architecture. Licensed to carry 3000 passengers in addition to a large crew, she is truly a floating city, and carries everything needed for their comfort and safety. Among the many attractive features that may be found are large and airy staterooms with running water in each, private staterooms and parlors, smoking and lounging rooms, a very elaborate dining room, as well as lunch and refreshment rooms, orchestra, etc. The practical features include a complete refrigerator plant, ventilating and air washing plant, telephones in each stateroom operated from a central switchboard, automatic fire sprinkler system, purified drinking water, emergency steering engine, bow rudder and in fact everything which goes to make up a modern steamboat.

There are nine decks in this boat including the tank top, which is fitted as a double bottom for ballast. The hull, main deck and housings are of steel, and, wherever wood is used in decks or top sides it has been fire-proofed. There are 470 staterooms and 24 parlors. The motive power is furnished by an inclined triple compound engine, 66-96-96 x 108-inch stroke, 12,000 horse power. Steam is supplied by three double-ended boilers, shown elsewhere in this catalog, and six single-ended boilers, 14 feet diameter x 10 feet 11¼ inches long, all for 165 pounds pressure.



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Steamer "City of Detroit III"

Another "Side-wheeler" similar to the "Seeandbee." Although somewhat smaller, this vessel is fitted out in the same sumptuous and high-class style which is typical of lake passenger vessels.

Length over all, 470' Breadth over guards, 93' Depth, 22' Hull breadth, 55' 4"
Triple Compound Inclined Engines, 62"-92"-92"x 102" 7000 I. H. P.



Steamer "Western States"

This illustration shows one of two sister ships for day and night service. These vessels are up to date in every respect and are built for first-class passenger work.

Length over all, 360' Breadth over guards, 78' 3" Depth, 19' 6" Hull breadth, 45' 3"
Triple Compound Inclined Engines, 52"-72"-72"x 84" 5000 I. H. P.



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Interior View of Steamer "City of Detroit III"

GRAND SALON

Illustrating the extensive joiner work as built in high-class passenger boats.

TO the average mind a steamboat consists principally of a hull containing some form of machinery to drive it, and we take pleasure in submitting on a few of these pages, illustrations taken from one of our latest boats, as characteristic of the decorative feature of interior work. This work is always indicative of some of the ancient architectural orders and they can be successfully adapted to ships as well as to buildings. The careful selection of rare and beautiful woods, which we obtain sometimes from foreign countries especially for this work, combined with the product of expert artists and decorators, all unite to make these interiors as beautiful and harmonious as those found ashore.



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Interior View of Steamer "City of Detroit III"

STAIRWAY

THE prominent interior features of any vessel are the lobby and main stairway as they naturally make the first impression as a person goes aboard. This picture illustrates clearly the high class of workmanship as well as the general effective appearance of a main stairway. The staterooms ranged along the sides are not given any prominence by elaborate doorways, etc., but are made a part of the whole scheme by paneling, fresco, etc. The balcony rail is handsome mahogany and the newel posts are utilized for electric lights in addition to the ceiling chandeliers. The great prominence is of course given to the mural above the landing, which completes the total scheme of decoration.



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Interior View of Steamer "City of Detroit III"

GOTHIC ROOM

FROM the appearance of the above illustration one might easily imagine this to be a portion of one of the great cathedrals of Europe, instead of the interior of a steamboat. The elaborate carving, leaded glass windows, cabinet work, etc., are products of our own craftsmen in our own shops. The wood used is imported from Mexico and the Philippine Islands and is selected especially for its beautiful grain and finishing qualities. We would call particular attention to the hand carving on the arches and caps of the columns.



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Interior View of Steamer "City of Detroit III"

LA SALLE WINDOW

ANOTHER illustration showing the difficult and intricate hand carving and cabinet work on passenger boats. While all boats are not as elaborately finished as this, especial care and attention is always given to all woodwork on our boats. Skilled and experienced men are employed for this work and the work turned out of our shops can be relied upon as being thoroughly and carefully done.



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Steamer "Tashmoo"

A day boat for passenger service only. This boat carries 4000 people and makes one round trip every day during the summer passenger season.

Length over all, 314' Breadth over guards, 65' 6" Depth, 13' 6" Hull Breadth, 37' 6"
Triple Compound Inclined Engines, 33"-51"-82" x 72" 2500 I. H. P.



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Steamer "Put-in-Bay"

Another fast passenger boat for day trips only. Licensed for 3500 people and running one trip each day, this boat is a popular one for pleasure excursions. Built of steel throughout and fitted with all the safety devices known to marine architects.

Length over all, 240' Breadth over guards, 60' Depth, 17' 3" Hull Breadth, 46'
Four-cylinder Triple-expansion Engines, 25"-40"-45"-45" x 36"



**Steamer
"Rochester"**

Length over all, 256'
Beam, 42' Depth, 14' 9"

**Steamer
"City of Grand Rapids"**

Length over all, 310'
Beam, 48' Depth, 27'



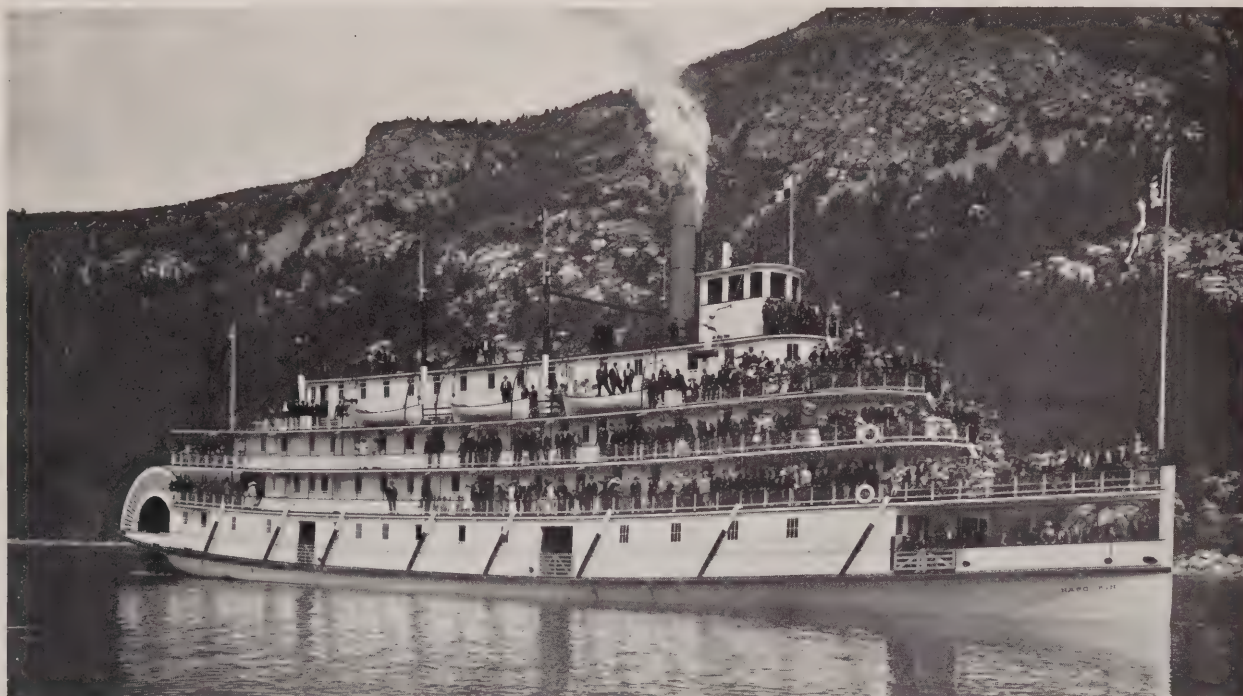
**Steamer
"Octorara"**

Length over all, 361'
Beam, 45' Depth, 28'



Passenger and Freight Steamers

The illustrations above show vessels built for both passenger and freight service, the "Octorara" being fitted with cargo hoisting apparatus shown elsewhere in this catalog. These steamers are representative of the class for night and day service, all having staterooms, and are furnished with everything necessary for the comfort and safety of the traveler, as well as the necessary safety devices required to pass U. S. Government Rules.



Steamer "Nasookin"

Shallow draft passenger and freight steamer "Nasookin" built for the Canadian Pacific R. R. for service on Lake Kootenay, B. C.

227' over all, 40' wide, driven by a stern paddle wheel 24' 6" diameter x 18' 6" wide. Two separate horizontal compound engines 16 $\frac{3}{4}$ " x 35 $\frac{3}{4}$ " x 96" stroke are connected to the wheel, one on each side. A locomotive-type firebox boiler 7' 6" diameter x 28' 2 $\frac{1}{2}$ " long, allowed 200 pounds pressure per square inch, supplies steam for the engines and auxiliary machinery. Speed, 20 miles per hour.

This steamer was erected at the shipyards, knocked down and shipped by rail to Lake Kootenay where it was again erected and launched and is now in service.



Steamer "Noronic"

A passenger and freight vessel built for Canadian trade. Strictly up to date in all parts. Fitted with cargo handling apparatus, wireless telegraph and other equipment necessary to the comfort and convenience of modern travel. The engines of this steamer are illustrated on page 58.

Length over all, 385'

Beam, 52'

Depth, 28' 9"



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Steamer "Columbia"

For passenger service on regular day service and excursions. An up-to-date boat for day trips to suburban river parks, completely equipped with devices for amusements, lunch counters, dancing floor, etc. Capacity, 3000 passengers.

Length over all, 216' Beam, 45' Depth, 17' 9"



Steamer "North West"

For passenger service only. Running from Duluth to Buffalo. This palatial steamer is well known on the Lakes. She is fitted with twin screws driven by quadruple-expansion engines. Her principle dimensions are:

Length over all, 358' Beam, 44' Depth, 24'



Steamer Pere Marquette No. 17—Car Ferry

For transporting freight or passenger cars between railroad terminals. These boats are very heavily built as they run throughout winter and are fitted to operate in heavy ice. This company has built twelve of these ferries for operation by various railroads, capable of carrying from 28 to 36 cars.

Length over all, 350'

Beam, 56'

Depth, 19' 6"

Twin Screws



Steamer Marquette and Bessemer No. 1

A bulk freight boat of a somewhat different type, in that coal cars are run onto her deck and the coal discharged into the hold direct. This boat is used for conveying coal in bulk from one railroad terminal to another across the lake.

Length over all, 255'

Beam, 43'

Depth, 21' 6"

Twin Screws



Package Freighter "Allegheny"

Package freight boats are fitted with large hatches in the spar and main decks as well as gangways in the ship's sides, so as to facilitate the rapid handling of the miscellaneous cargo.

Length over all, 371' 2"

Beam, 46'

Depth, 30'



Package Freighter "Duluth"

Another of the many package freighters on the lakes built by this company, carrying all kinds of package and box freight, machinery, steel products, etc. The vessels are equipped with special cargo handling apparatus for this kind of freight. Steel construction throughout, with bulkheads and ballast compartments.

Length over all, 401'

Beam, 50'

Depth, 30'



Steamer "Calcite"

A bulk freight boat used for carrying coal, stone, limestone, etc. This boat carries its own unloading apparatus, which is capable of unloading 7500 tons in seven hours and by means of the boom shown on deck, the cargo can be piled up on dock 90 feet from the ship. The ship is constructed as a long hopper divided into compartments at the bottom of which is a series of spouts. The openings in the spouts are provided with gates which open to allow the cargo to pass down upon the conveyor belt, running the full length of the cargo space. The cargo is then taken off the belt, up through the hoist forward and thence overboard by means of the boom. This vessel is:

Length over all, 436'

Beam, 54'

Depth, 29'



Steamer "Kelley Island"

A new trade has developed in recent years which has created a new type of boat commonly known as sandsuckers. The "Kelley Island" is steel throughout and fitted with ballast tanks below the cargo space. A 15-inch centrifugal pump forward has a capacity of 9000 gallons per minute. The vessel is 186 feet long with a cargo capacity of 1200 tons.



Fire Tug "Wm. A. McGonagle"

For harbor and dock fire service. This vessel is 120 feet long and is equipped with two 14-inch turbine-driven centrifugal fire pumps, capable of delivering 12,000 gallons of water at 150 pounds pressure. Both pumps working together will deliver 6000 gallons at 300 pounds pressure. This boat is one of two which were built for fire protection for the great ore docks of Lake Superior. An innovation on the McGonagle which is worthy of note is a jet steering gear for turning and maneuvering quickly in cramped spaces. A 4-inch pipe was run from the fire pumps to the stern on each side below the water line. By suitable gearing connected to quick-opening valves in these pipes, water was discharged overboard at a high velocity on either side. By this means, the position of the boat can be quickly shifted when working at a fire without starting the main engines. The control of this gear is at all times in the hands of the wheelsman or captain.



Wrecker "Favorite"

Probably no boat is more familiar to all lake sailors than the "Favorite." Very heavily built and powerful, and equipped with all necessary pumps and tackle for wrecking jobs of any sort. She is fitted with wireless telegraph and is always ready to go where required.

Length over all, 195'

Beam, 43'

Depth, 19' 6"



Steamer
"Eugene
Buffington"

Steamer
"Geo. F. Baker"



Steamer
"James Farrell"

For the Iron, Coal and Grain Trades

Vessels built for iron, coal and grain trades only. 600 feet over all, 58 feet beam, 12,000 tons capacity. These steamers are of the largest sizes on the lakes and are built of steel throughout, arch construction with wide hatches. The hull is divided into compartments for water ballast and these run up as high as the main deck stringers, forming side ballast tanks. The Steamer "Farrell" is built on the Isherwood System of ship construction which is illustrated elsewhere in detail.



**Steamer
"The Harvester"**
Length over all, 545'
Beam, 58' Depth, 31'
Capacity, 11,750 tons



**Steamer
"Howard M. Hanna, Jr."**
Length over all, 524'
Beam, 54' Depth, 30
Capacity, 9,700 tons



**Steamer
"W. Grant Morden"**
Length over all, 625' Beam, 59'
Depth, 32' Capacity, 13,000 tons of
coal or iron ore; 540,000 bushels of
wheat. Load Draft, 19' 6"

Vessels built for Iron, Coal and Grain Trades only

These illustrations show three of the latest ore boats on the lakes, the "Morden" being the longest coarse freighter in the world. They are all of arch construction, the "Harvester" and "Morden" being built on the Isherwood System, and are fitted with side ballast tanks, wide hatches and all modern requirements.



Steamer
"Robert Wallace"
Length over all, 255'
Beam, 41' Depth, 18'



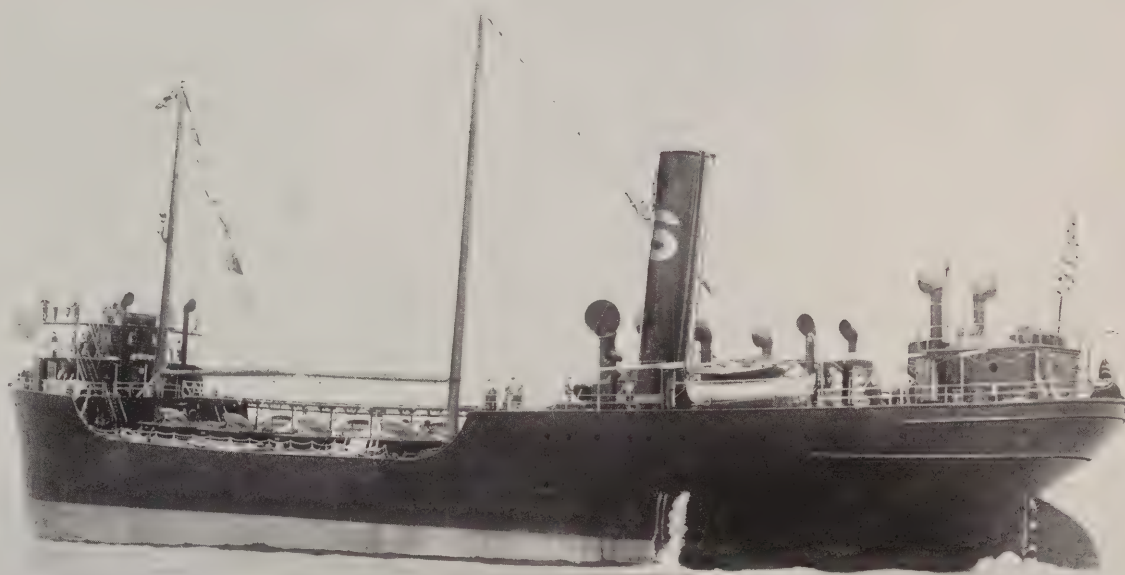
Steamer
"Adrian Iselin"
Length over all, 257'
Beam, 43' Depth, 23'
Capacity, 3,000 tons



Steamer
"John Sharples"
Length over all, 255'
Beam, 41' Depth, 18'

Special Types for Bulk or Package Freight

Special types of vessels for bulk or package freight, trading between ports on the Great Lakes and St. Lawrence River. Built the maximum size which can pass the Welland Canal locks and for salt water as well as fresh water, except the "Iselin" which is for fresh water service only.



Steamer "Comet"

ONE of five similar vessels for The Standard Oil Co. Built under Lloyd's survey for first class of bulk oil carriers for ocean service. Capacity, 1,000,000 gallons. These boats are divided into separate tanks by a series of cross bulkheads as well as a fore and aft center bulkhead and by means of a complicated system of piping connected to two large pumps installed forward. These tanks are loaded and unloaded simultaneously or separately. Different kinds of oil may be carried in these tanks or a complete cargo as may be required. These boats are built on the Isherwood System of hull construction.

Length over all, 260' Beam, 43' Depth, 25'

**Detailed Views Showing
the Forward and Aft
Decks of the Steamer
"Comet"**

This illustrates very clearly
the intricate work involved in
the construction of an oil tank
steamer.

The expansion tanks are the
prominent feature on deck and
the flying bridge from aft to
forward is also pictured.





Barge "S. O. Co. No. 88"

One of seven bulk oil barges constructed by this company for The Standard Oil Co.'s ocean fleet. Very similar in detail to the steamers excepting that they have no propelling machinery, being towed by one of the steamers. Sails are fitted to the barges, both as an aid to speed and for ease in maintaining headway.

Length over all, 260'

Beam, 43'

Depth, 23'



Steamer "Renown"

For lake trading in bulk oil. Capacity, 1,800,000 gallons. Similar in construction to the vessels described on pages 26 and 27, except that the "Renown" is larger, being 390' 5" long, 52' beam, 25' depth, and also built to the Isherwood System.



Lake Tug "J. T. Horne"

125 feet long. For heavy towing work on the Lakes, such as lumber and timber rafts, strings of barges and scows, etc. Being all of steel these tugs can withstand all heavy weather and are well fitted for the rough work for which they are designed.

Tugs of this size are used for breaking ice in harbors and have been known to break ice 36 inches in thickness.



Sea-Going Tug "R. W. Wilmot"

156 feet long. Built for ocean and gulf work in connection with a wrecking company. This tug was built in Cleveland and under her own power went to the Gulf of Mexico by way of the St. Lawrence River and Atlantic Ocean.



Fishing Tug "Louisville"

One of a large fleet built by this company for lake fishing work. Steel throughout. Fitted with a 12 x 14-inch engine and one Scotch boiler 7 feet 6 inches diameter by 9 feet long.

Length over all, 70'

Beam, 16'

Depth, 7' 6"



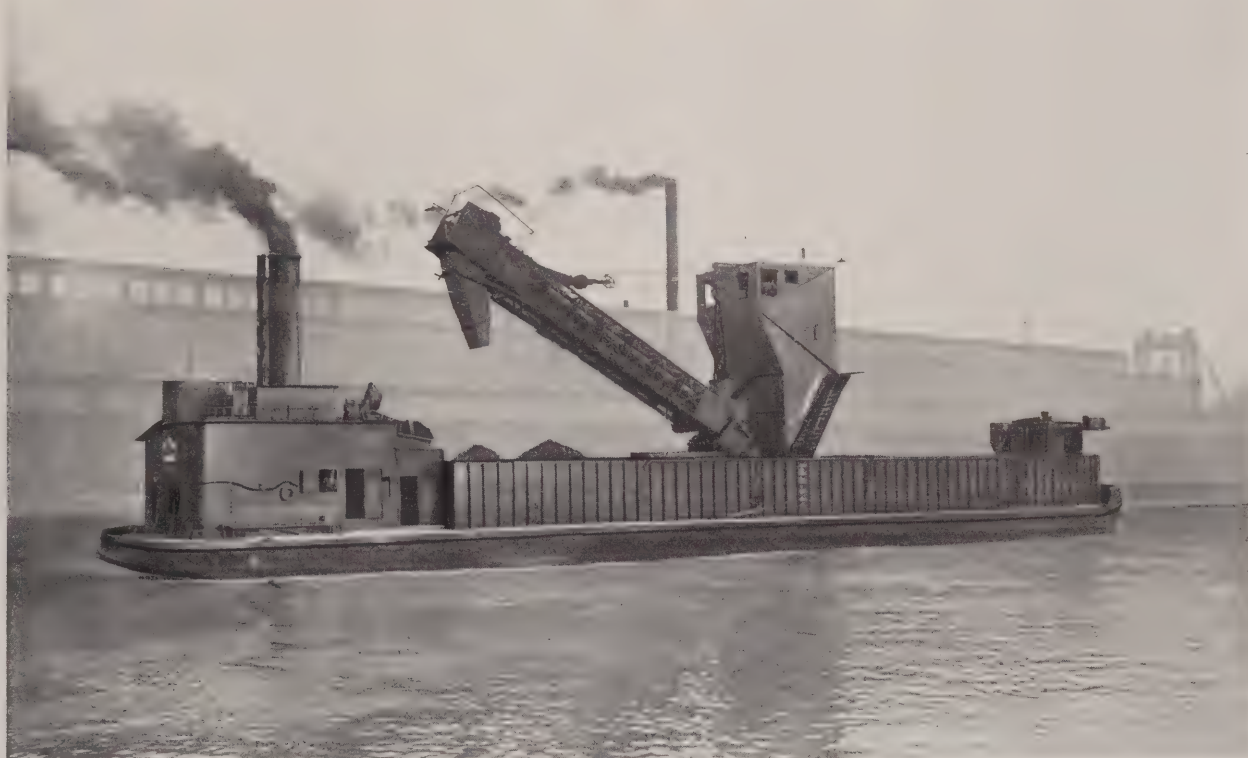
Steel Tug "W. B. Sanders"

Built for towing on the Lakes, strongly constructed for rough service. Compound engines 20-40 x 30 inches with one firebox boiler 11 feet diameter by 14 feet long.

Length over all, 93'

Beam, 21'

Depth, 12'



Steamer "West Shore"

A steel fuel boat for harbor work only. When time in port is limited or for various reasons a vessel is unable to shift to a fuel dock, this boat ties up alongside and discharges her coal to the bunkers of the larger boat. 1000 tons total capacity—unloading capacity 350 tons per hour.

Length over all, 168' Beam, 36' Depth, 15' Twin Screws



Steamer "Pittsburgh"

Fuel lighters for coaling steamers in port. These boats carry their own coal conveying apparatus and deliver coal directly into bunkers of boats. Fitted with two Scotch boilers and twin screw engines.

Total capacity, 1000 tons; unloading capacity, 300 tons per hour. This boat has handled more than 75,000 tons of coal in one season.

Length over all, 164' Beam, 40' Depth, 21' 9"



Steamer "Chautauquan"

A small passenger boat, 85 feet over all, built for service on a small inland lake in connection with an amusement park. Two steel hulls, 80 feet long, between perpendiculars, separated 8 feet apart and decked over to form one structure. Shipped by rail in sections to the lake. Carrying capacity, 500 passengers.



Steamer "Niagara Frontier"

A passenger and freight ferry boat. For Niagara River service.
This ferry carries automobiles, trucks, wagons, etc., as well as people and makes regular trips.
Length over all, 131' Beam, 38' 10" Depth, 14'



Barge "James H. Pellett"

Steel barges for carrying broken stone or sand. Fitted with ballast tanks, donkey boiler, pumps, windlass, steering engine, etc.

Length over all, 189'

Beam, 36'

Depth, 15'



Drill Boat No. 1

A five-drill steel hull submarine drill boat used for deepening rock bottom channels. The drills are submerged to rock bottom and holes drilled wherever required. These holes are later filled with dynamite which is electrically exploded, thus removing as much rock as necessary. These boats are fitted with boiler, winch and anchor engines, ballast tanks and pumps, etc.

Length over all, 140'

Beam, 35'

Depth, 7' 6"



Steam Yacht "Wadena"

Steel Steam Yacht. Engine, triple-expansion, $15\frac{1}{2}$ -26-42 x 22 inches. Boiler 12 feet 6 inches diameter, 12 feet long.
Length over all, 160' Beam, 21' Depth, $12\frac{1}{2}$ '



Revenue Cutter

One of several revenue cutters built for the Government service on salt water.
Length over all, 205' 6" Beam, 32' Depth, 17'



Steam Yacht "Comanche"

Length over all	-	-	-	-	-	-	-	-	185'
Beam	-	-	-	-	-	-	-	-	25'
Depth	-	-	-	-	-	-	-	-	14' 9"

THIS yacht was constructed for the late Senator Hanna and has a steel hull and triple expansion engines. She was designed for salt water service as well as for fresh water and has all the necessary requirements for a vessel of this character. At the outbreak of the Spanish War she was purchased by the Government and converted into a gunboat and saw active service in this branch until the close of the war.



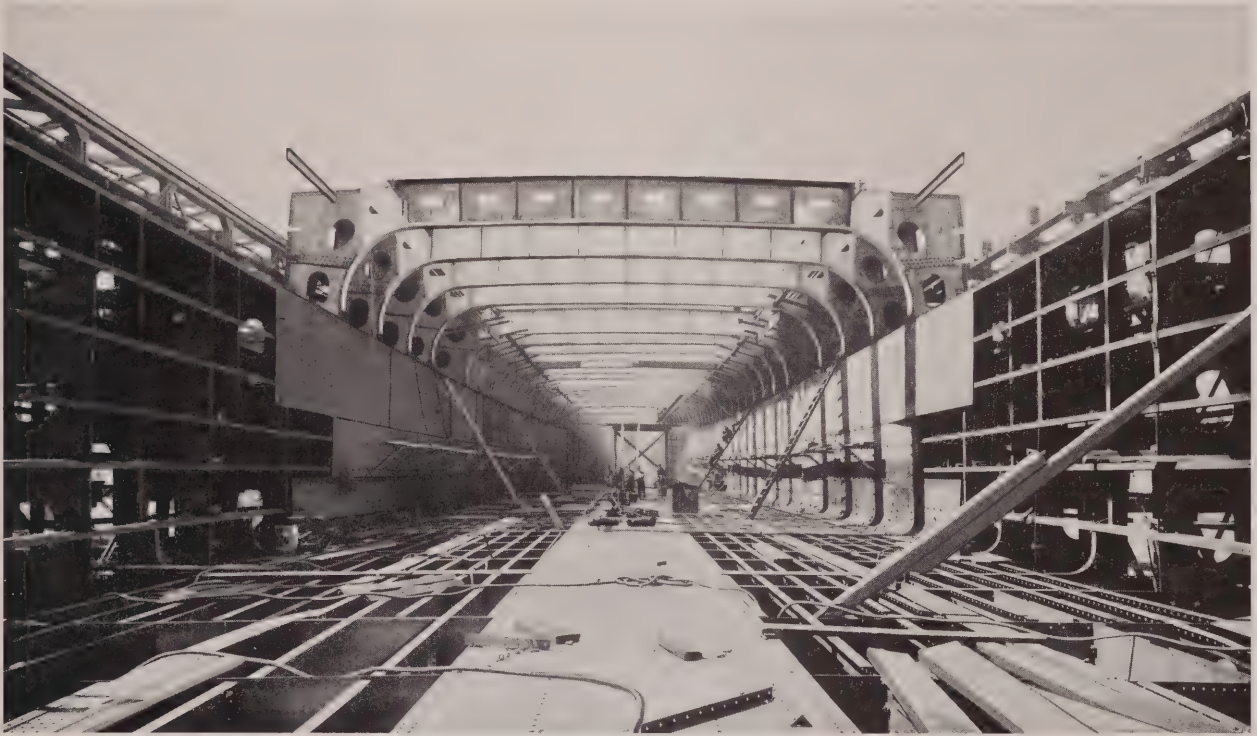
The Isherwood System of Ship Construction

THE "Isherwood" or longitudinal system of construction of ships is probably well known to most of the holders of this book, but a brief description may be of interest. In the system, the transverse frames are in the nature of deep web frames or partial bulkheads, spaced generally twelve feet apart. The deep floors in the waterbottom are spaced generally six feet apart. The "ordinary" frames are run in a fore and aft direction instead of transversely, and are in one piece extending between the water-tight divisions and securely connected to the bulkheads. The tank top stiffeners and deck beams are fitted in the same manner. It can readily be seen that this construction adds greatly to the longitudinal strength of the ship and this is of especial importance on the Great Lakes where the draft is limited and the proportions of depth to length are very high, for instance: the practice on salt water used to be to make the length ten times the depth. On the "Lakes" the length is usually eighteen times the depth.

It has been found that for two ships, one longitudinally framed and the other framed transversely, of the same dimensions and strength, the "longitudinal" ship is much lighter. This can be taken advantage of by increased deadweight carrying capacity, by making the model finer, or by making the "longitudinal" ship the same weight as the transverse one, thereby securing a very much stronger ship.

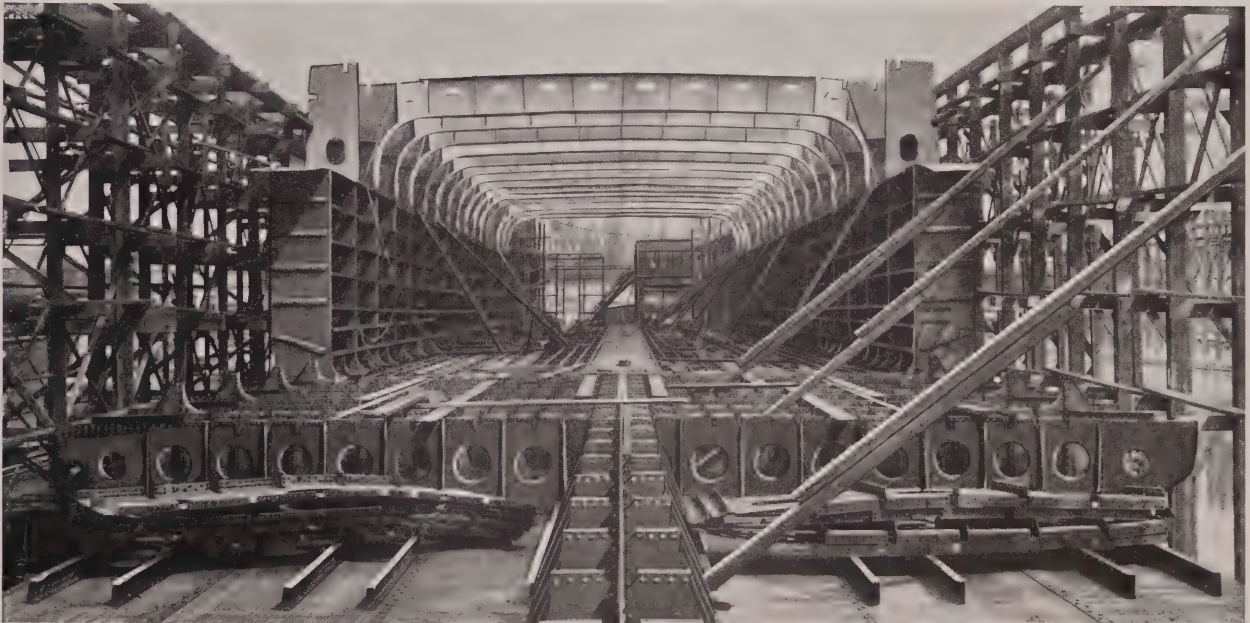
This system has been adopted by owners and builders in all parts of the world and classed by the leading classification societies; up to the ending of the year 1914, 290 vessels have been built, representing about 1,310,000 gross tons. This includes a number of vessels built on the Great Lakes and which have been entirely satisfactory.

The American Ship Building Company own the license to build these boats on the Great Lakes and will be pleased to make suggestions on contemplated designs.



Midship Section of Lake Steamer

Built on Isherwood System, showing arches and deep web frames being erected.

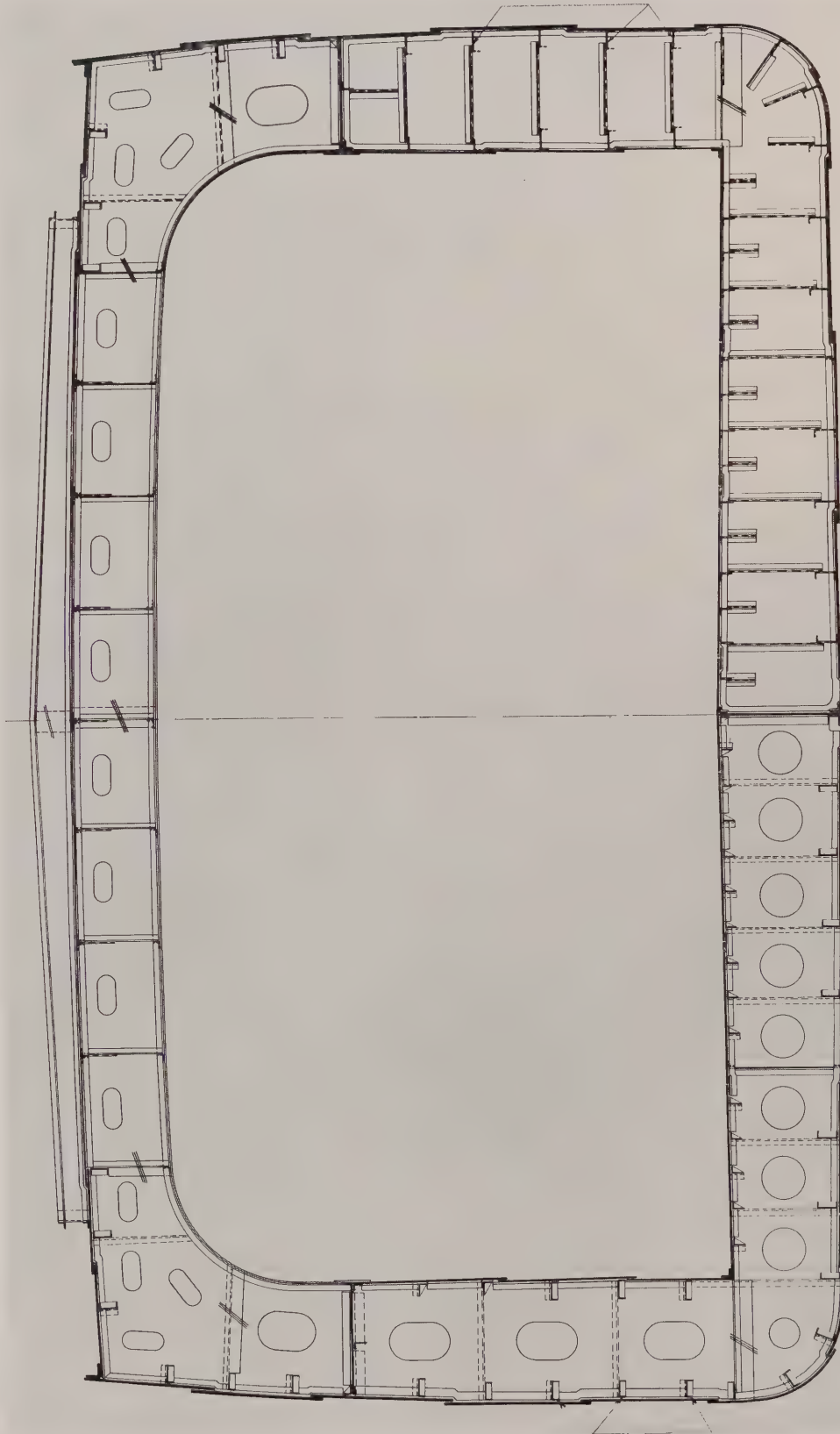


Midship Section of Lake Steamer

Built on Isherwood System, showing erection of bottom plating, fore and aft longitudinals and floors.



Bracketed Endings of
Continuous Longitudinal Frames



Half-cross Section in Way of Water-tight Divisional Bulkhead

Half-cross Section in Way of Ordinary Transverse Web Frame

Midship Section of Bulk Freight Lake Steamer

Built on the Isherwood System of Continuous Framing

Continuous Longitudinal Frames in
One Piece between Bulkheads



**Steamer
"Hamiltonian"**
Length over all, 257'
Beam, 42' 6"
Depth, 26' 6"



**Steamer
"Noronic"**
Length over all, 385'
Beam, 52'
Depth, 28' 9"



**Steamer
"Richard Trimble"**
Length over all, 600'
Beam, 58' Depth, 32'



**Steamer
"S. O. Co. No. 120"**
Length over all, 258'
Beam, 40' Depth, 13'



Tugs "Baltimore," "New York," Etc.
Length over all, 70' Beam, 16' Depth, 7' 6"

General Views of Launchings

This and the following page illustrate the manner of launching lake vessels as carried out in our yards. These vessels are launched sideways either directly into a river, slipway, or sometimes into a dry dock. Vessels are occasionally launched with all machinery installed, but the general practice is to place machinery after launching.



**Steamer
"William C. Moreland"**

Length over all, 600'
Beam, 58' Depth, 32'



**Bow View of a Lake
Vessel Leaving the
Launching Ways**



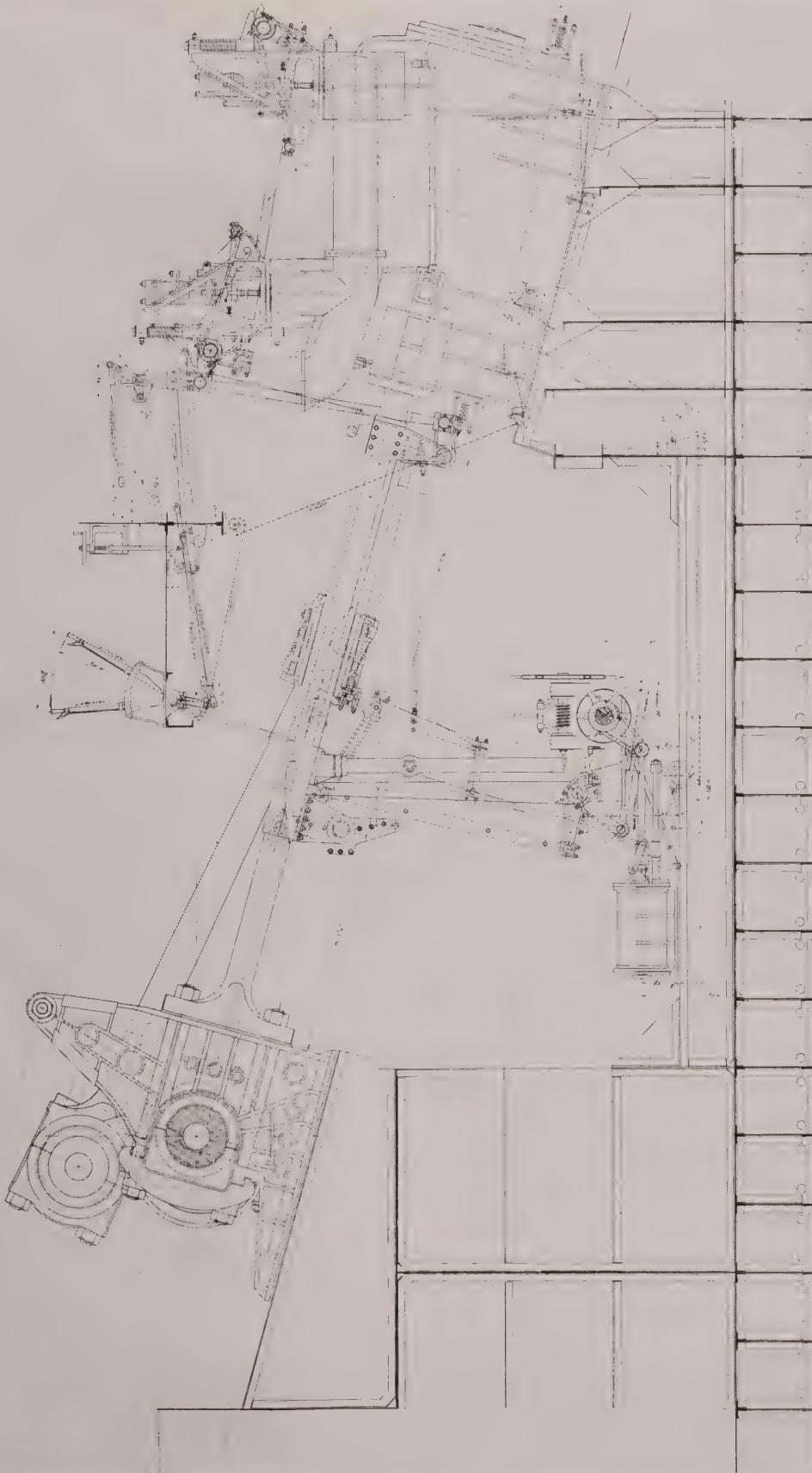
**Steamer
"Charles S. Price"**

Length over all, 524'
Beam, 54' Depth, 30'



Steamer "Thomas Walters"
Length over all, 600' Beam, 58' Depth, 32'

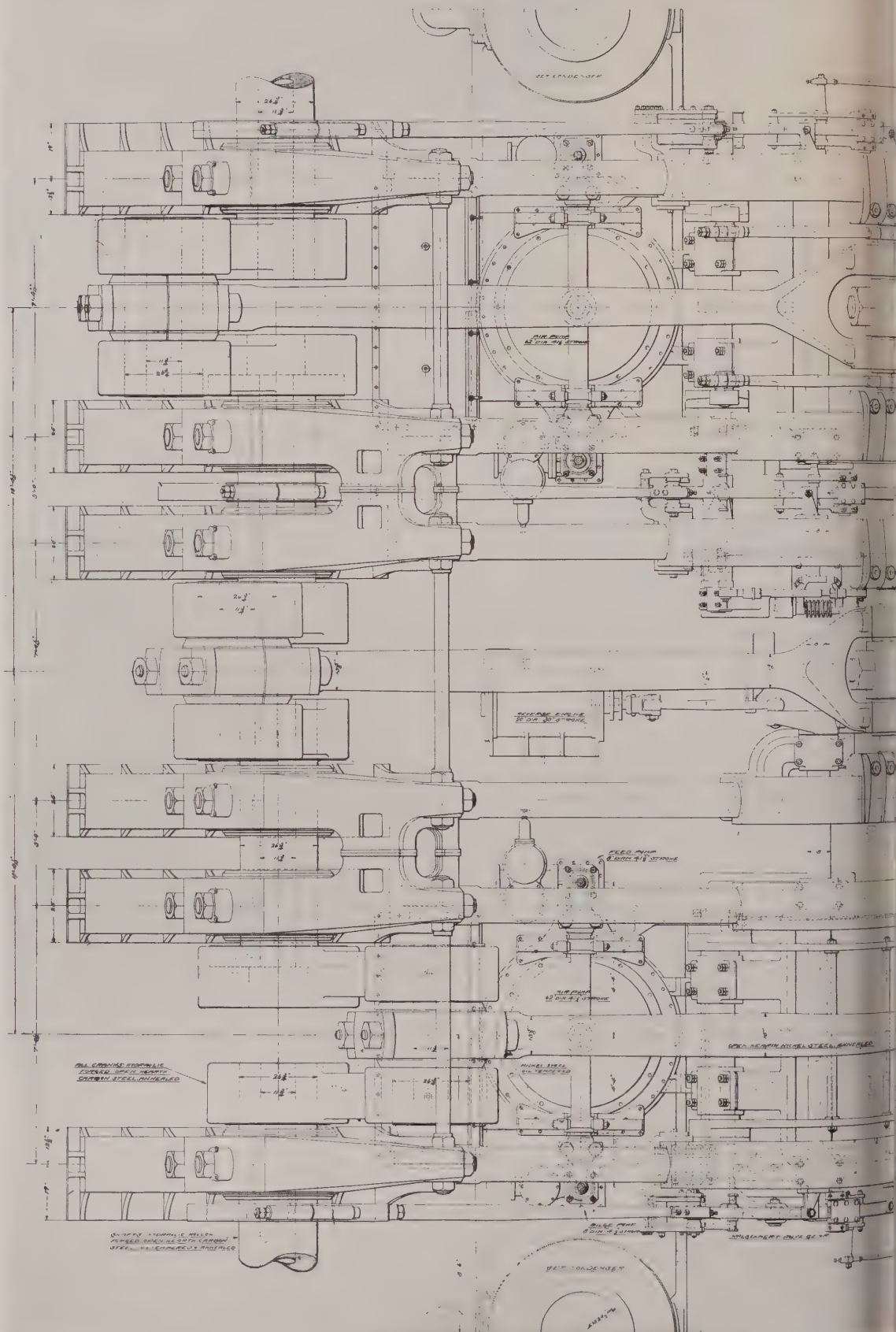
General Views of Launchings

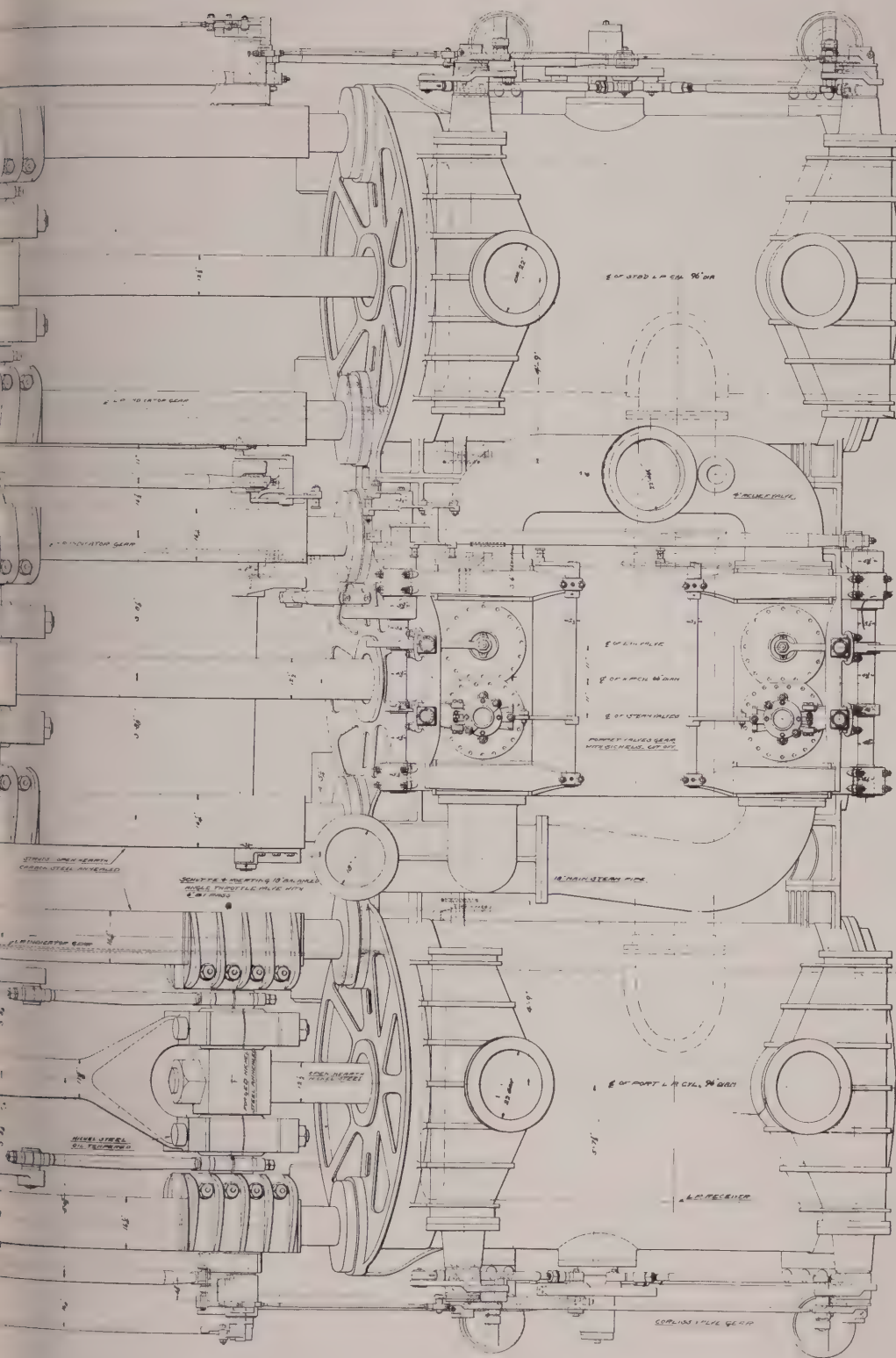


Side Elevation of High Pressure Engine of Steamer "Seeandbee" 66-96-96 x 108

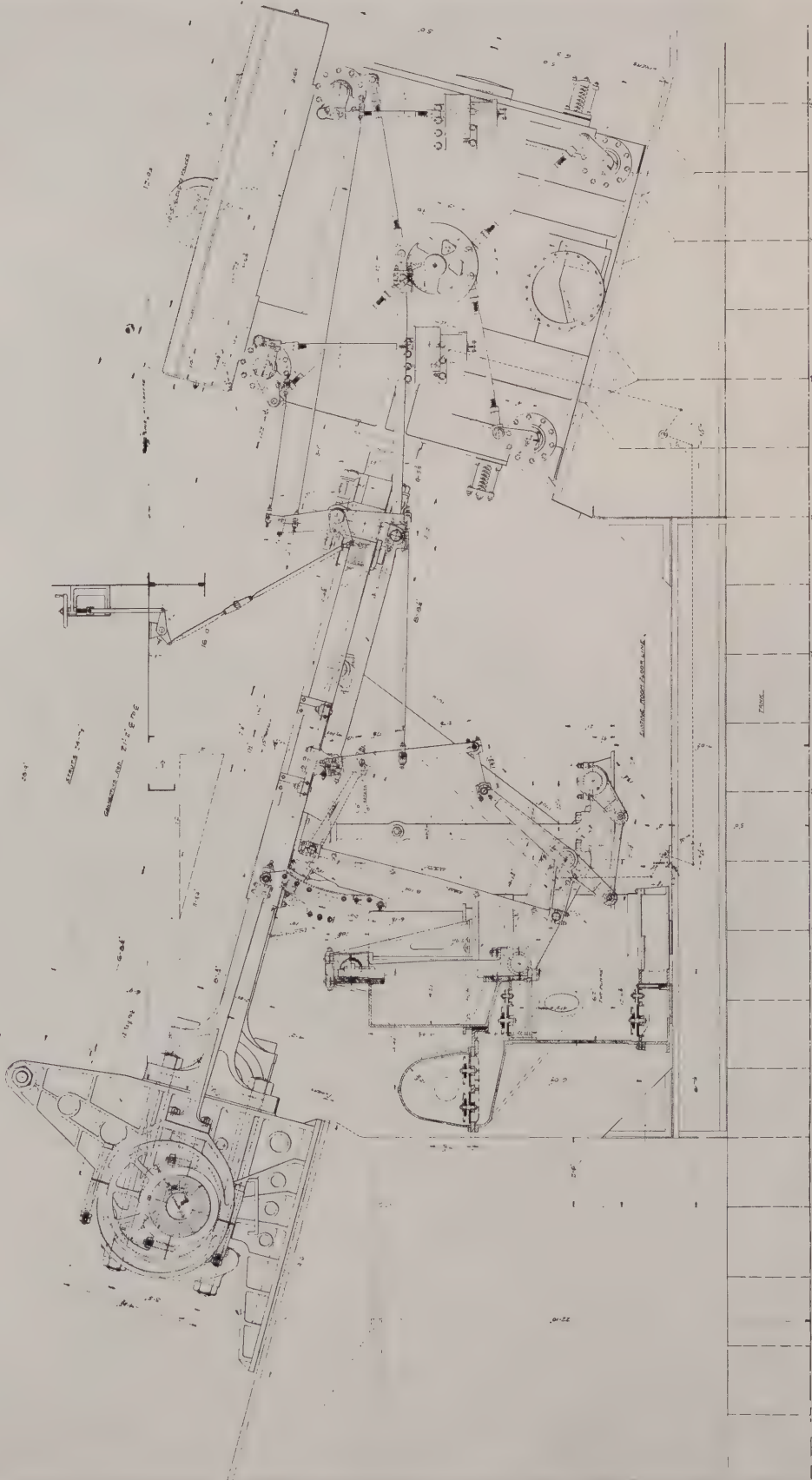
This plan shows the general design of a modern paddle wheel engine. The cylinder has poppet valves on each end fitted with "Sickles" cut-off which is controlled from the handling stand. The valve gear is a departure from established practice, in that it is of the Walschaert type as now commonly fitted to locomotives, driven by one eccentric. The main pedestal bearings are steel castings, with steel shells lined with friction metal. Connecting rods are open hearth steel forgings, 21 feet 2 inches center to center, weighing $11\frac{1}{2}$ tons each. Piston rods nickel steel forgings $11\frac{1}{2}$ inches in diameter. The crankshaft is hollow open hearth carbon steel in three sections, 78 feet 6 inches long, $26\frac{3}{4}$ inches diameter in the main journals and $29\frac{3}{4}$ inches diameter in the outboard bearings. The finished shaft weighs 120 tons. The engine has the usual steam reverse gear as well as an auxiliary hand gear.

Plan View
of Triple
Compound
Engines of
Steamer
"Seandbee"



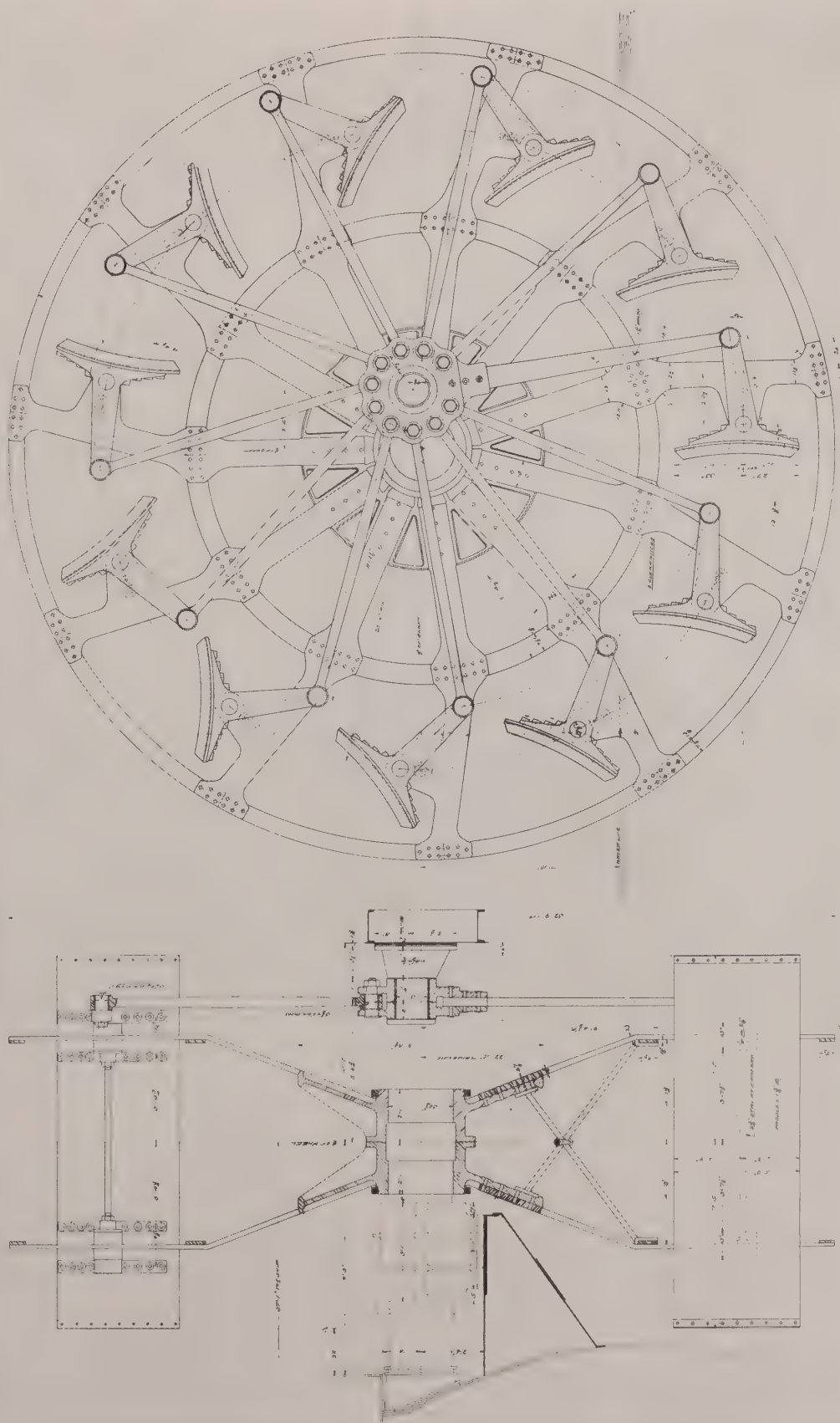


Cylinders
66-96-96 x 108
inch stroke.
12,000 horse
power.



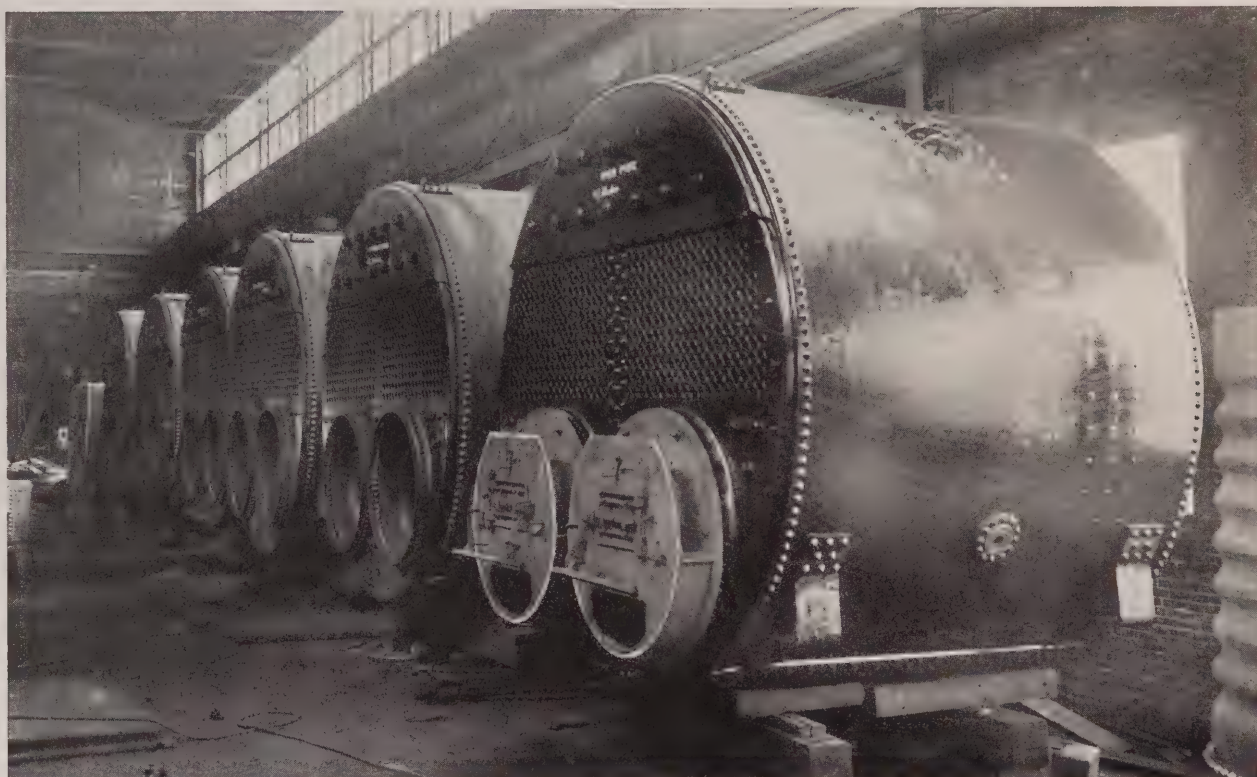
Side Elevation of Low Pressure Engine of Steamer "Seeandbee"

Showing Corliss valves driven by Walschaert valve motion. There are two air pumps, 62 inches diameter by 41½-inch stroke. There are also two feed and two bilge pumps driven from the same crosshead. The main steam pipe to the engine is 18 inches diameter connected to a Schutte & Koerting Co. balanced throttle valve. Each low pressure cylinder exhausts to its own condenser through a 24-inch pipe.



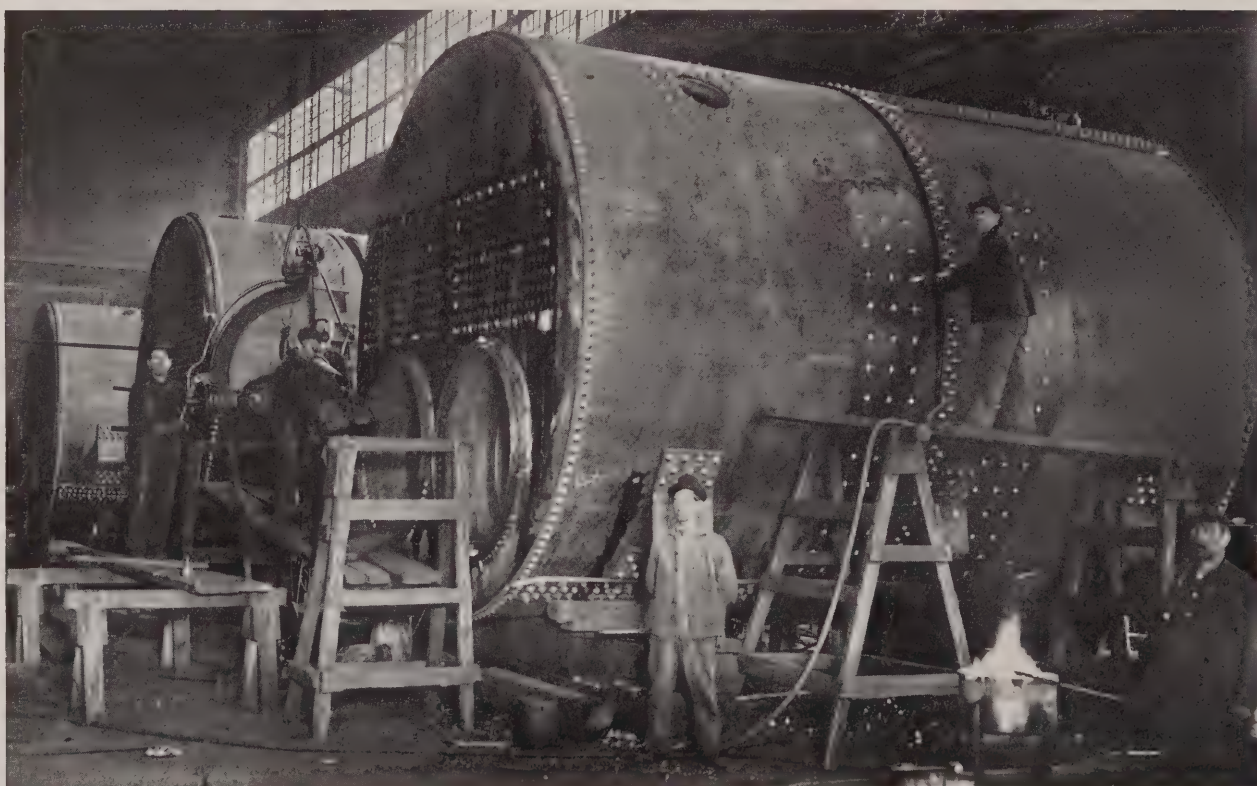
Paddle Wheels for Steamer "Seeandbee"

The two wheels are of the feathering type, 30 feet diameter over the outside of the buckets and 32 feet 9 inches extreme diameter. The hub centers, eccentrics and bearings are of cast steel and the radius arms and rims of heavy forged iron. Each wheel weighs about 100 tons.



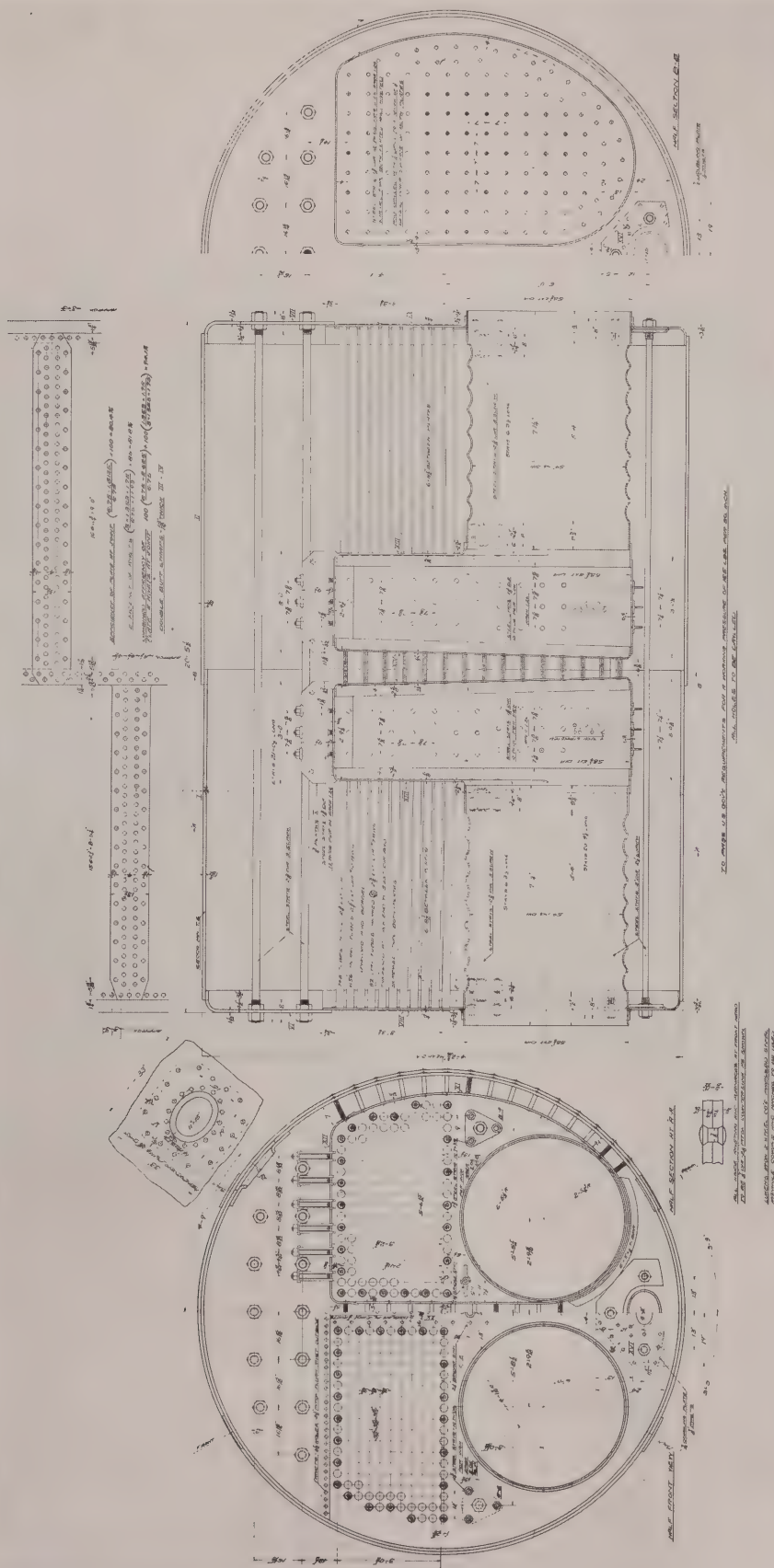
Six Single-End Boilers for Steamer "Seeandbee"

14 feet diameter x 10 feet 6 inches long. 165 pounds pressure.



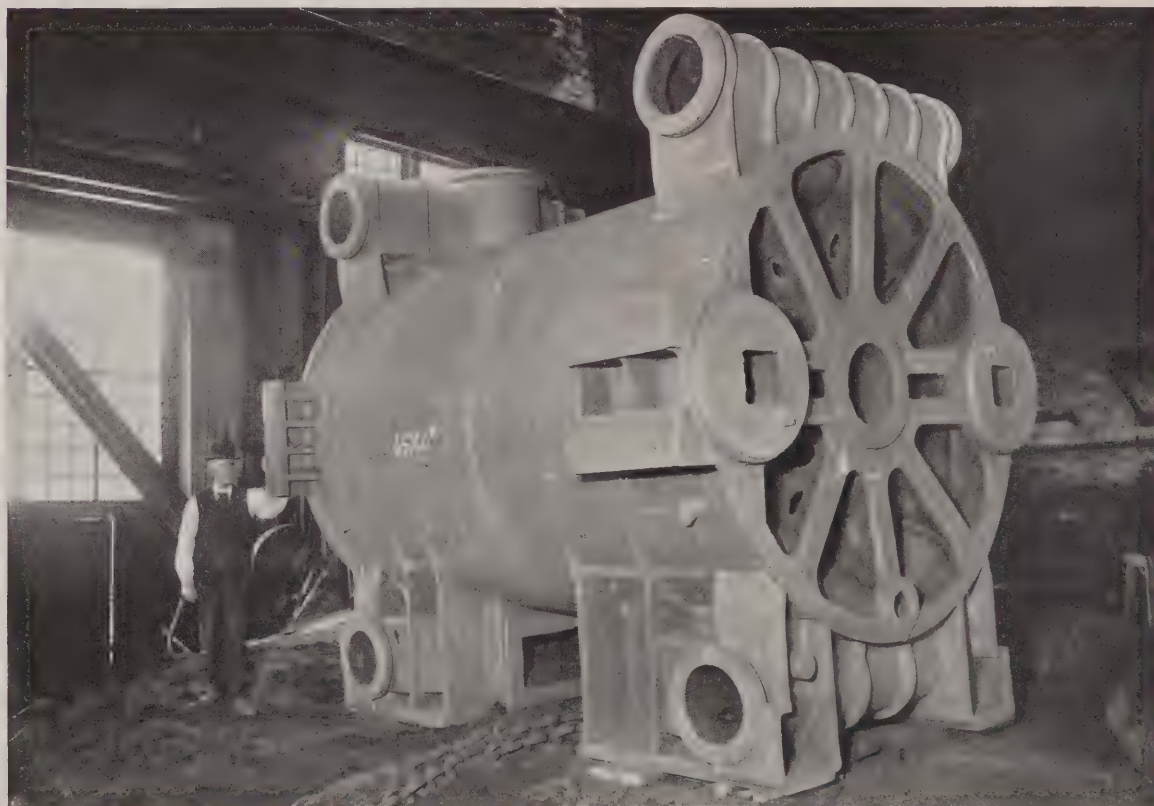
Three Double-Ended Boilers for Steamer "Seeandbee"

14 feet diameter x 21 feet 10½ inches long. 165 pounds pressure.



Double-Ended Boiler for Steamer "Seandbee"

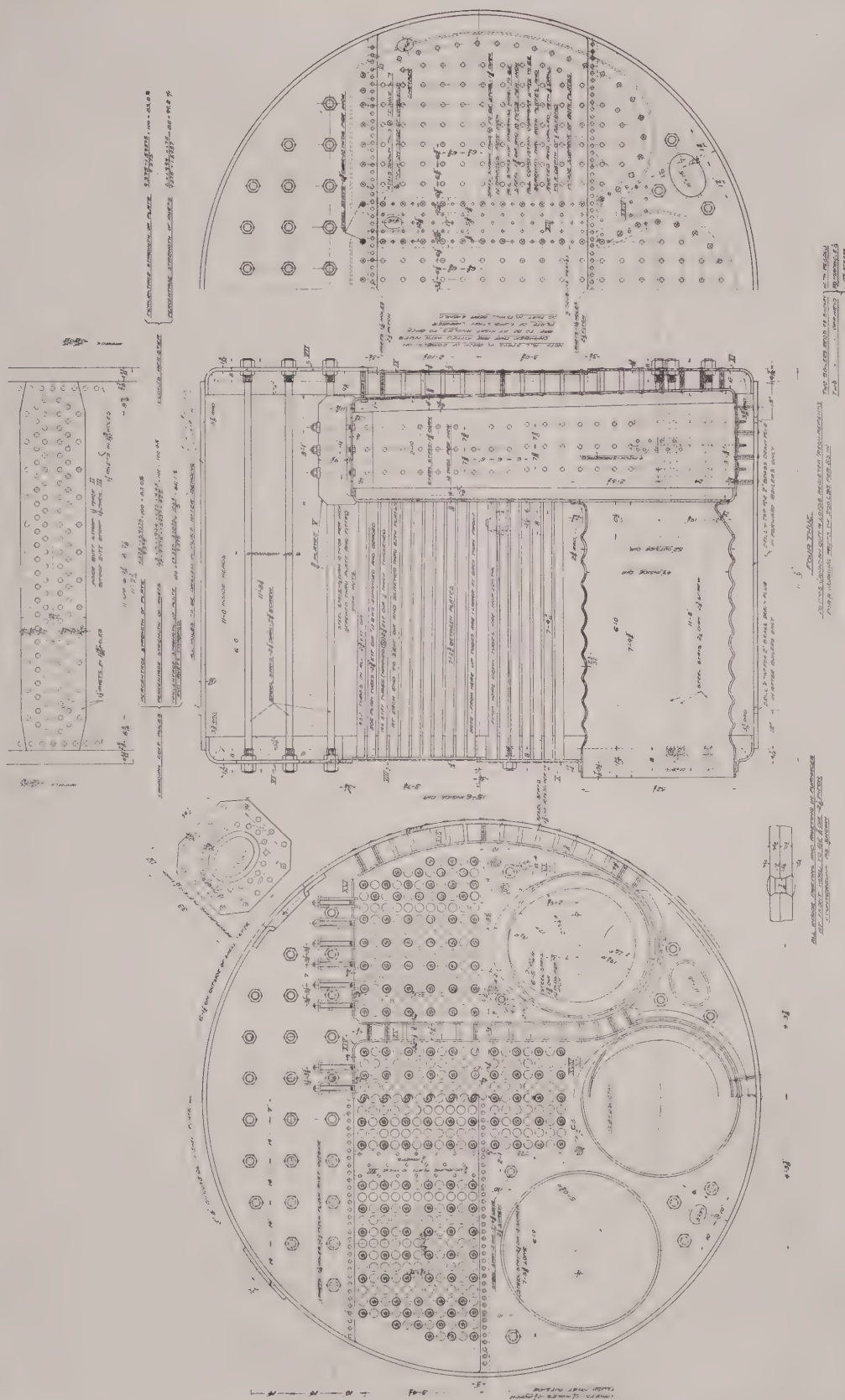
Three boilers of this type together with six single-ended boilers are installed in this steamer, being built for 165 pounds pressure, and to pass all the requirements of the U. S. Steamboat Inspection Service. They are 14 feet diameter x 21 feet 10½ inches long, and each contains four 54-inch diameter Morrison corrugated furnaces.



One of the Low Pressure Cylinders for Steamer "Seeandbee"

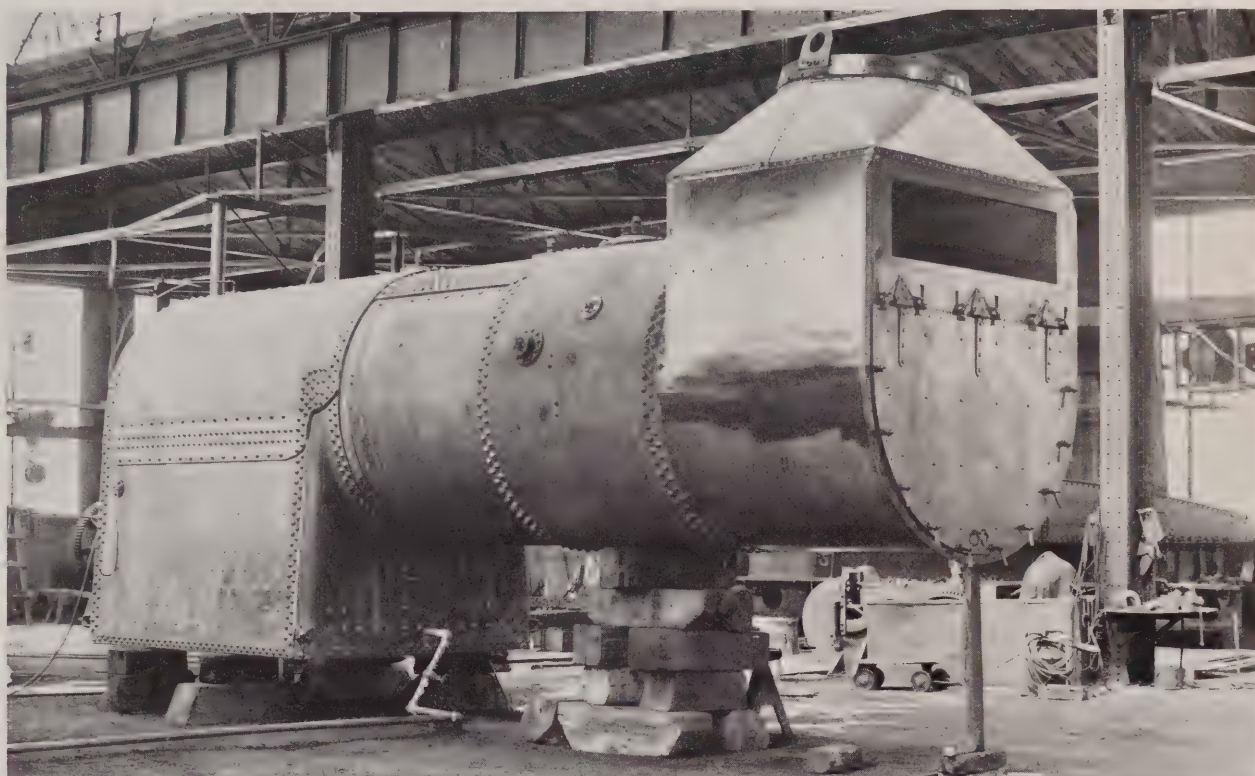
Illustration of Heavy Foundry Work

Made of semi-steel with a tensile strength of more than 30,000 pounds per square inch. Each cylinder weighed over 65,000 pounds in the rough condition before being machined.



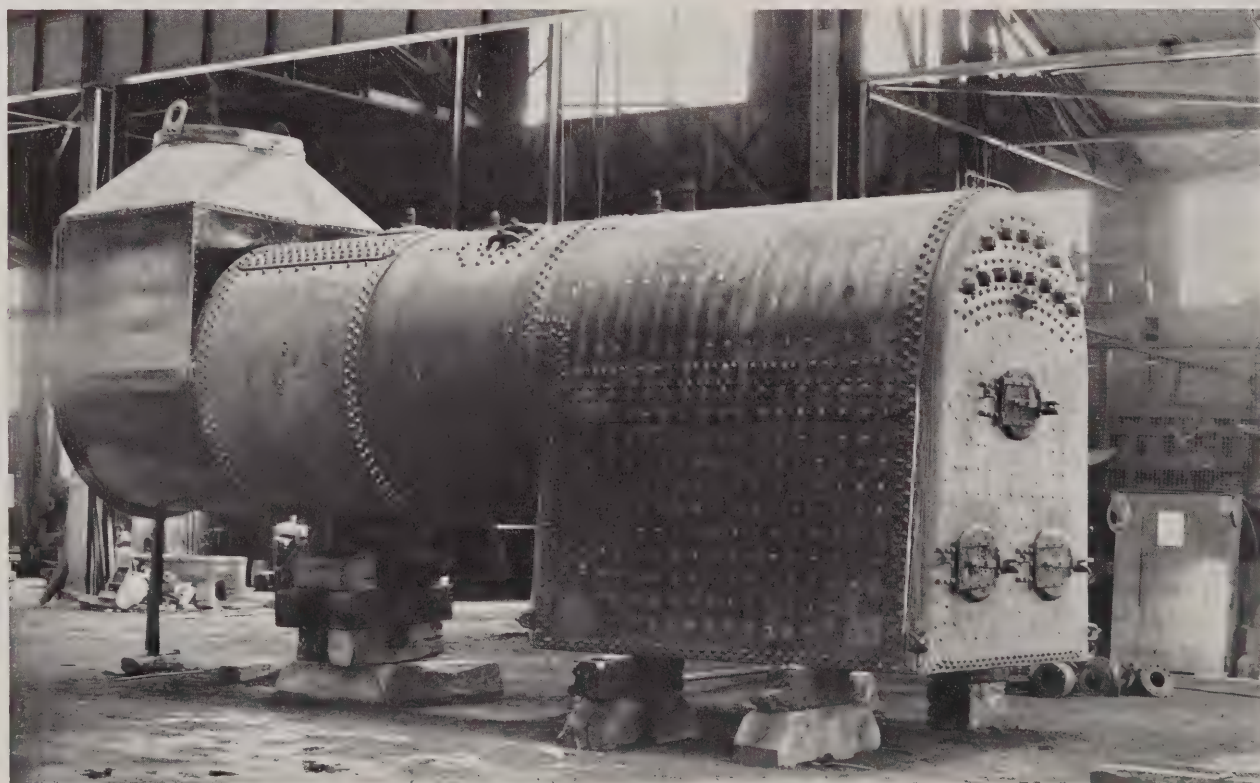
Scotch Boiler for Passenger Steamer "Noronic"

One of the largest boilers built for passenger boats, being 15 feet 6 inches long and made to pass the Canadian Steamboat Inspection Rules and the highest class of Lloyd's Rules, for a working pressure of 200 pounds per square inch. The shell plates are in one piece longitudinally and are 1 1/2 inches thick.



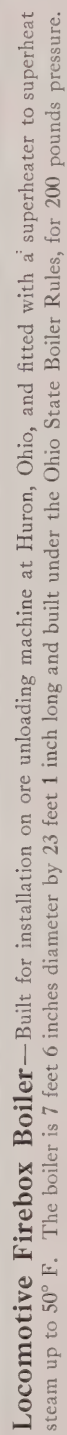
Firebox Boiler

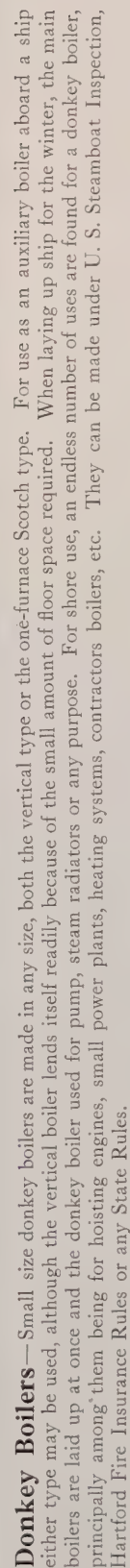
This picture shows the smoke box end of the boiler illustrated below. A superheater is fitted in this box capable of heating steam to 50° superheat.

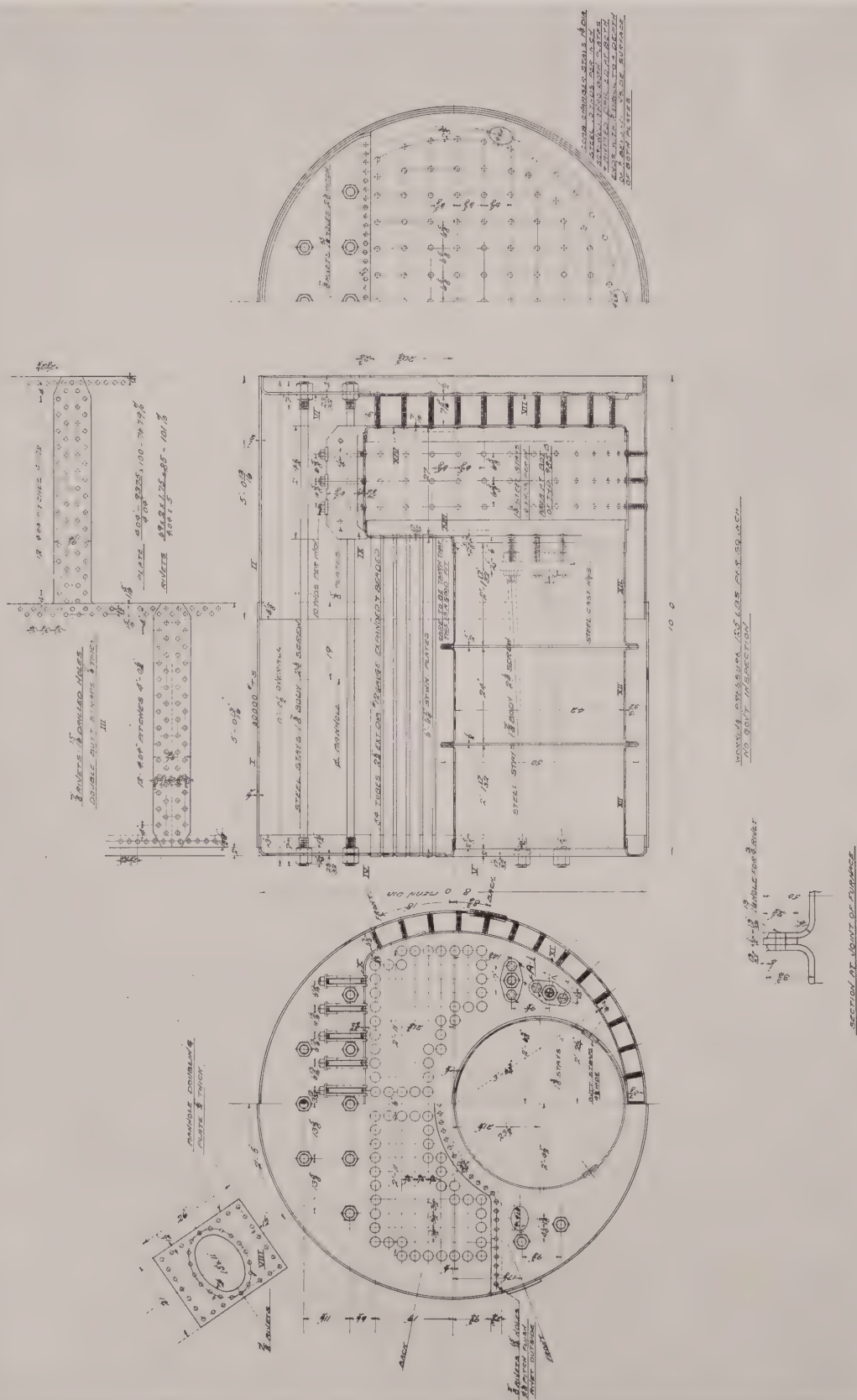


Another View of Firebox Boiler

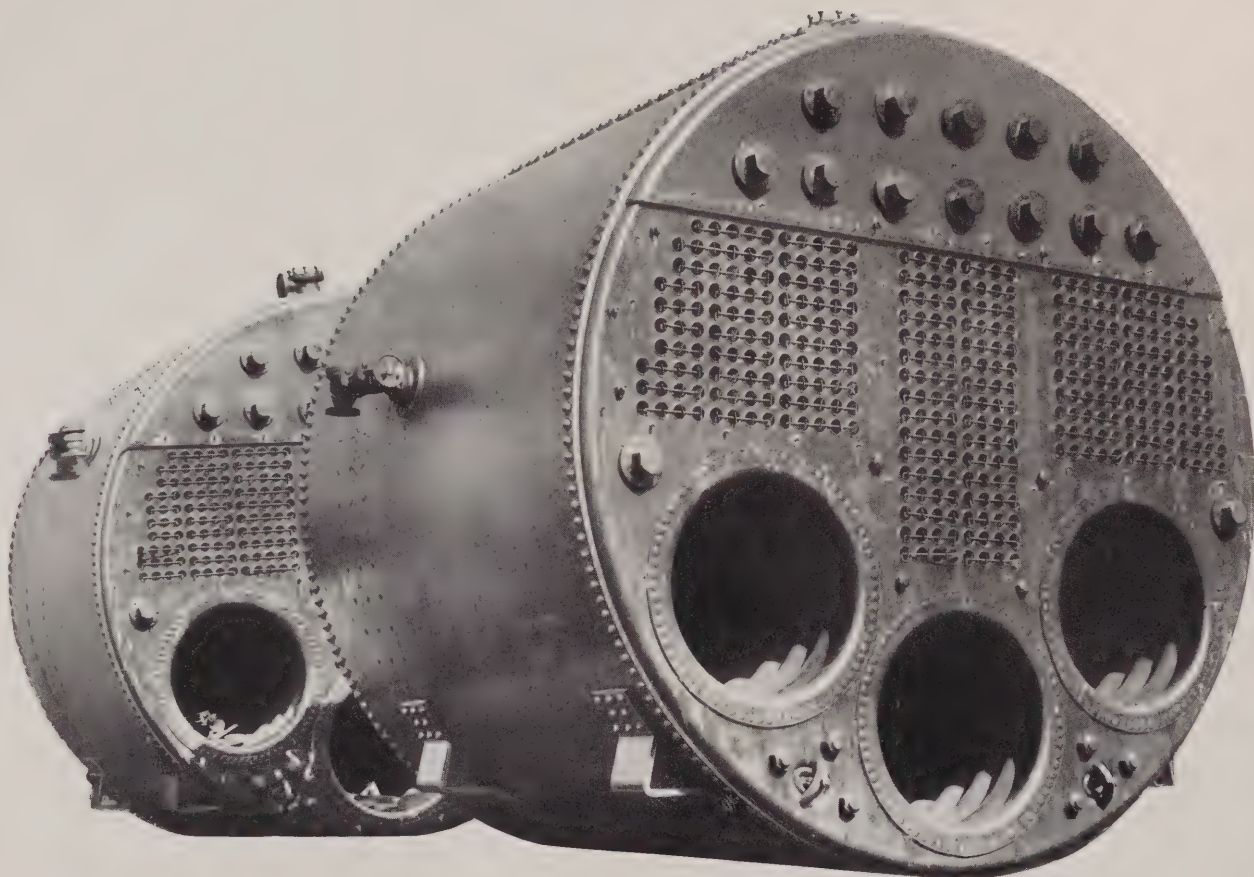
For description of this boiler see page 51. Boilers are shown on the testing floor.
7 feet 6 inches diameter by 23 feet 1 inch long for 200 pounds pressure.





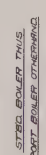


Donkey Boiler—Scotch Type

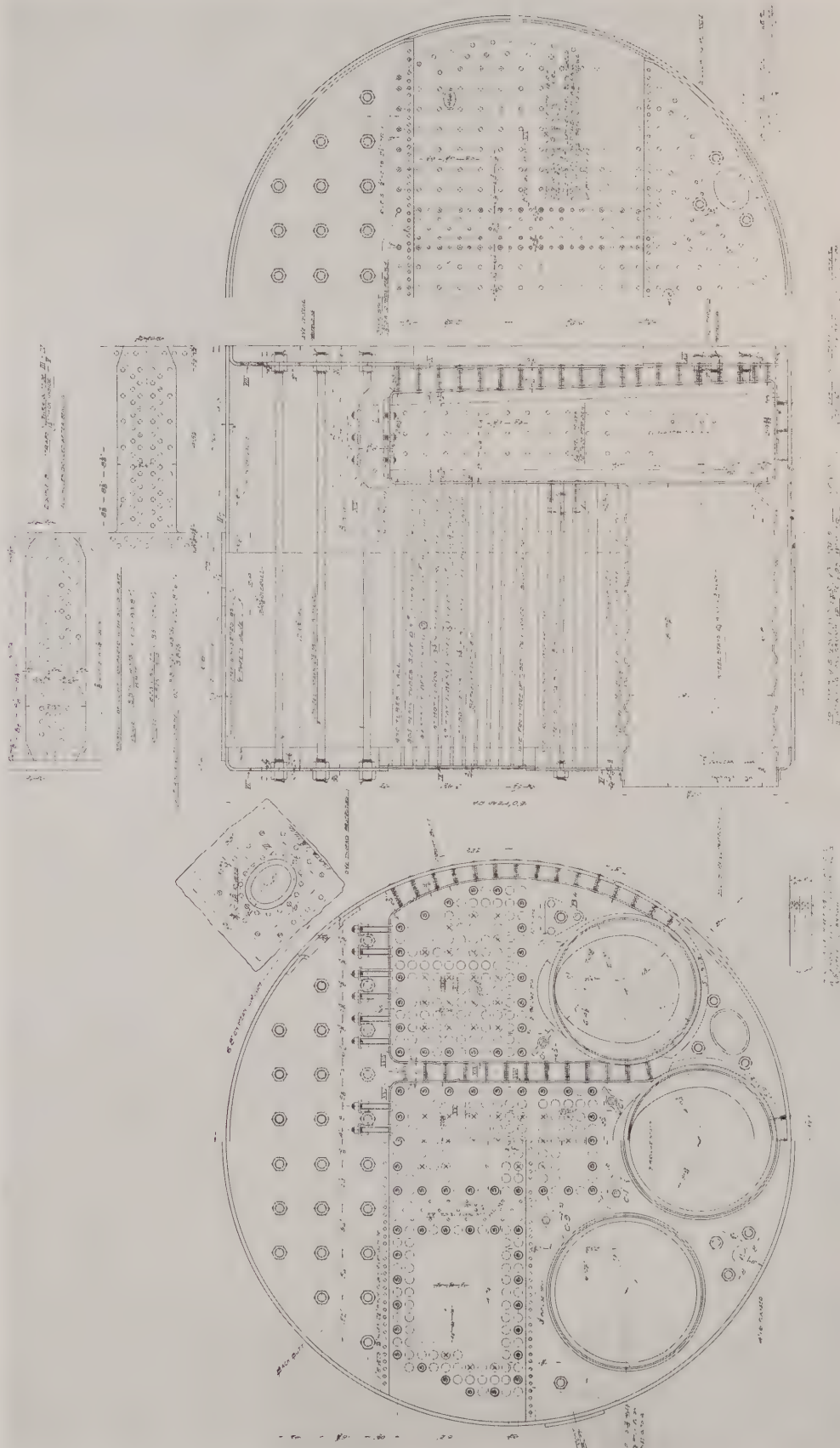


Scotch Boilers for Steamer "Brownell"

14 feet 6 inches inside diameter by 10 feet 6 inches long, for 170 pounds pressure, containing three 43-inch Morrison corrugated furnaces. Shell in two plates, 130 inches long without center girth seam.

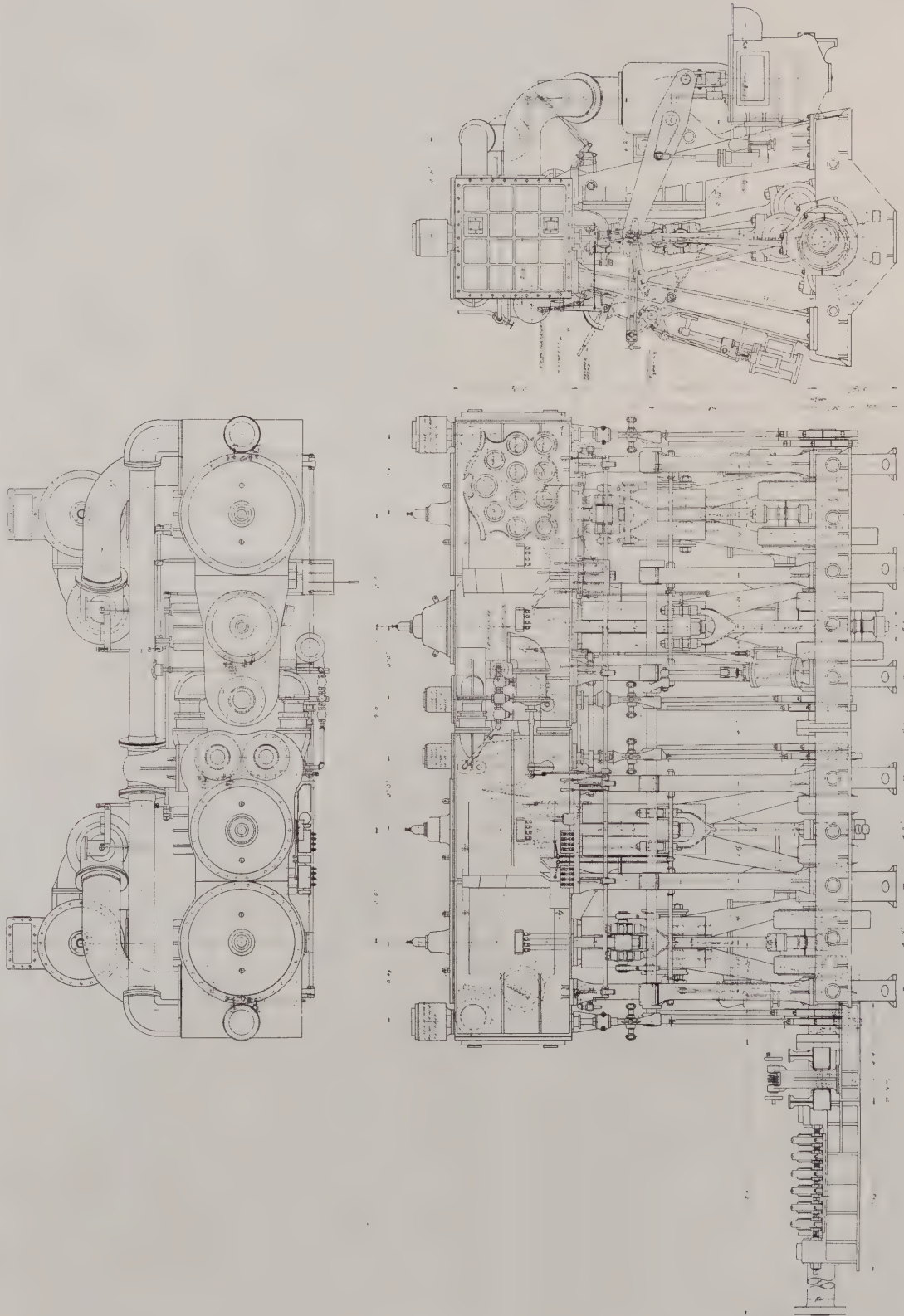


Boiler for Steamer "Brownell"



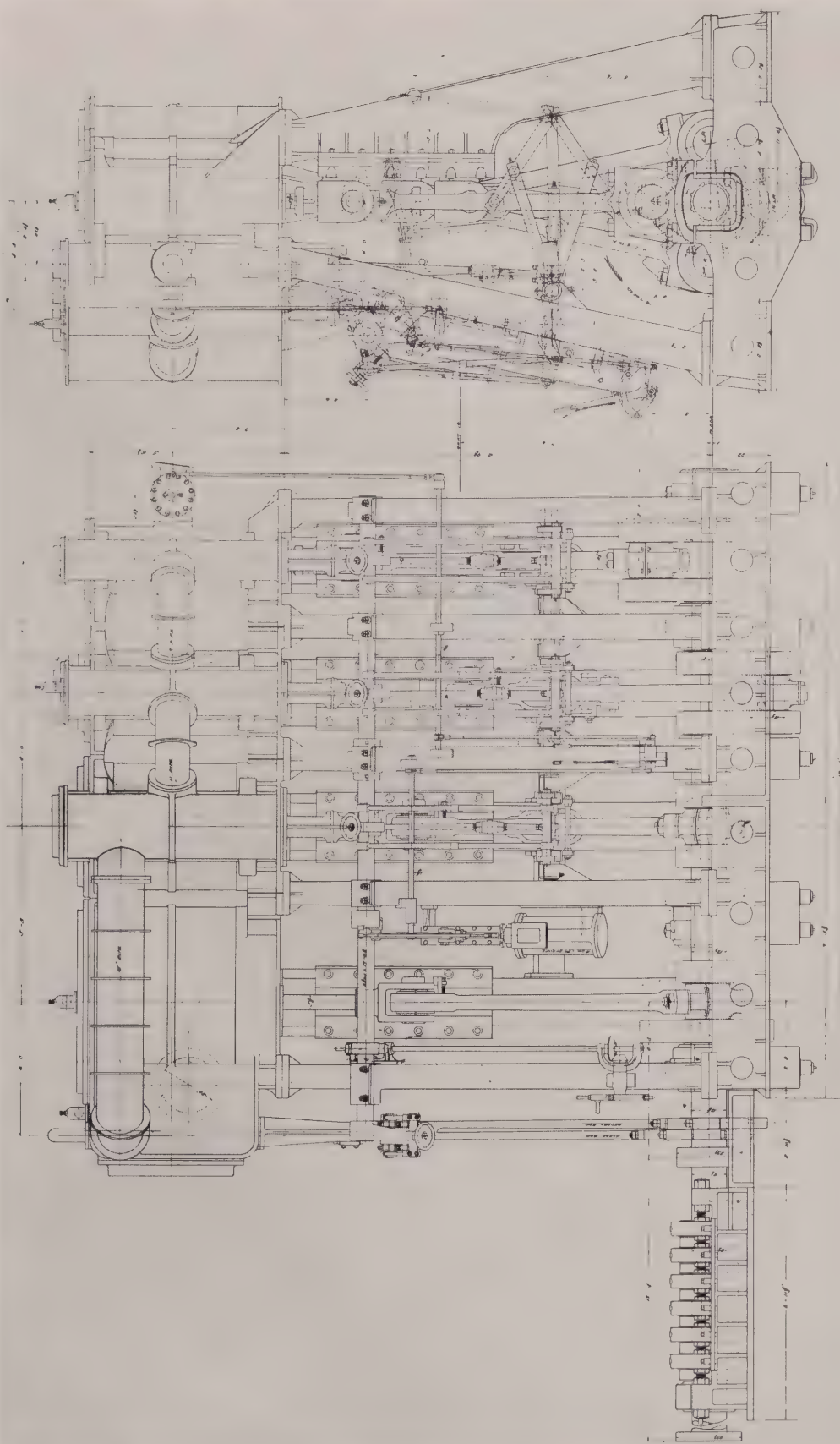
Scotch Boiler for Steamer "James A. Farrell"

Built to pass the U. S. Inspection Rules and also Lloyd's Inspection, for a working pressure of 170 pounds per square inch. Two boilers of this type are installed, each 16 feet diameter by 11 feet 6 inches long, with three 48-inch diameter Morrison furnaces. Scotch boilers are built in a variety of sizes and for any pressure.



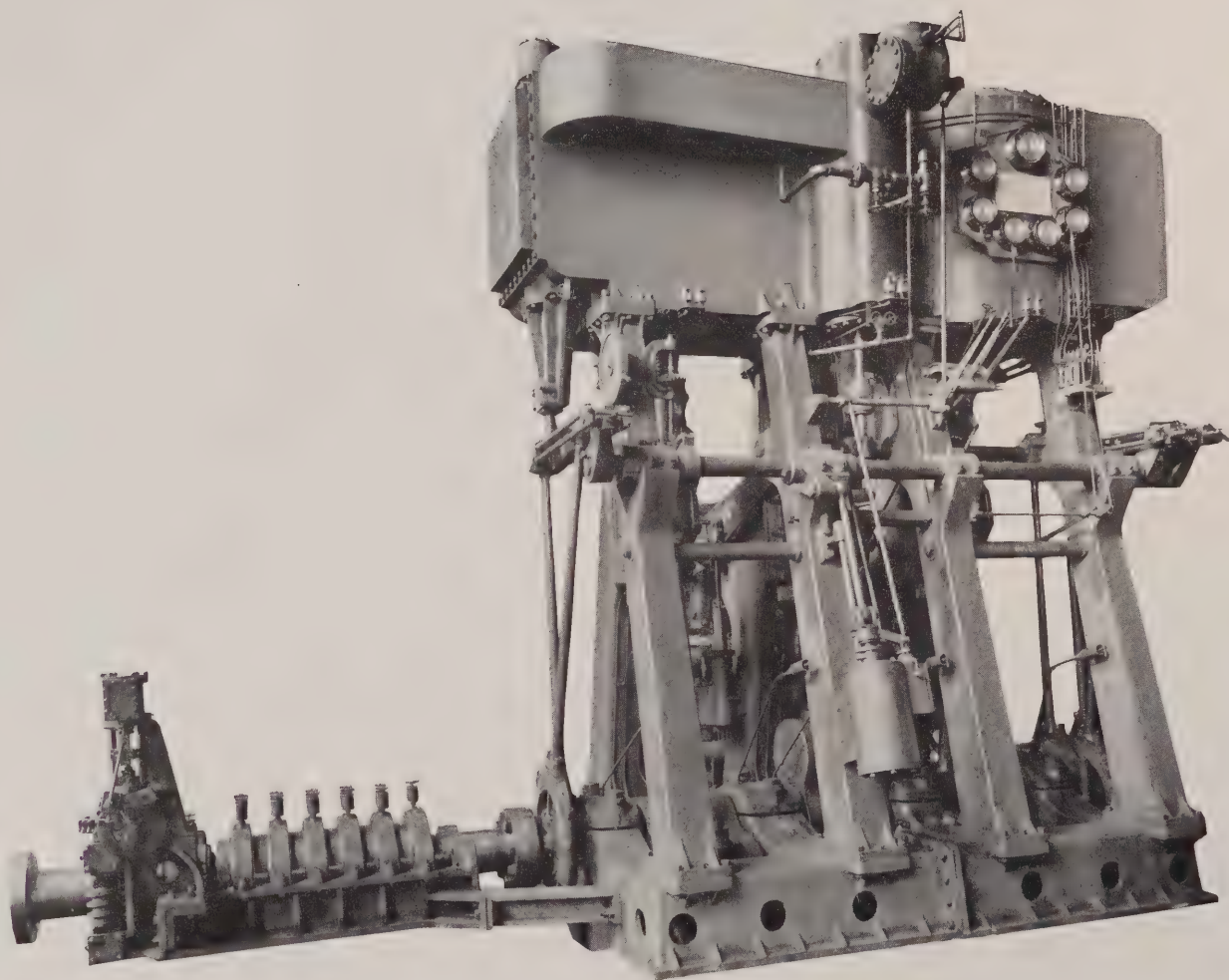
Engine for Steamer "Noronic"

Four-cylinder triple-expansion engine for passenger steamers of about 4800 I. H. P., cylinders $29\frac{1}{2}$ - $47\frac{1}{2}$ - 58 - 58 x 42-inch stroke, balanced on the Yarrow, Schlick, Tweedy system, and equipped with Lovekin patent assistant cylinders on all valves, two Edwards patent air pumps 33 inches diameter by 14-inch stroke, double turning engine $4\frac{1}{2}$ inches diameter by 5-inch stroke, and steam reverse gear.



Quadruple-Expansion Engine

This type of engine has been fitted to a number of lake freight steamers. The cylinders are 18½-28½-43½-66 x 42-inch stroke and develop over 2000 I. H. P. The high pressure, first and second intermediate cylinders are fitted with piston valves driven by Joy valve gear, while the low pressure has a double ported slide valve fitted with the Stephenson gear. This makes a very short, compact engine which is necessary on the Lakes where fore and aft space in the engine room is very limited.

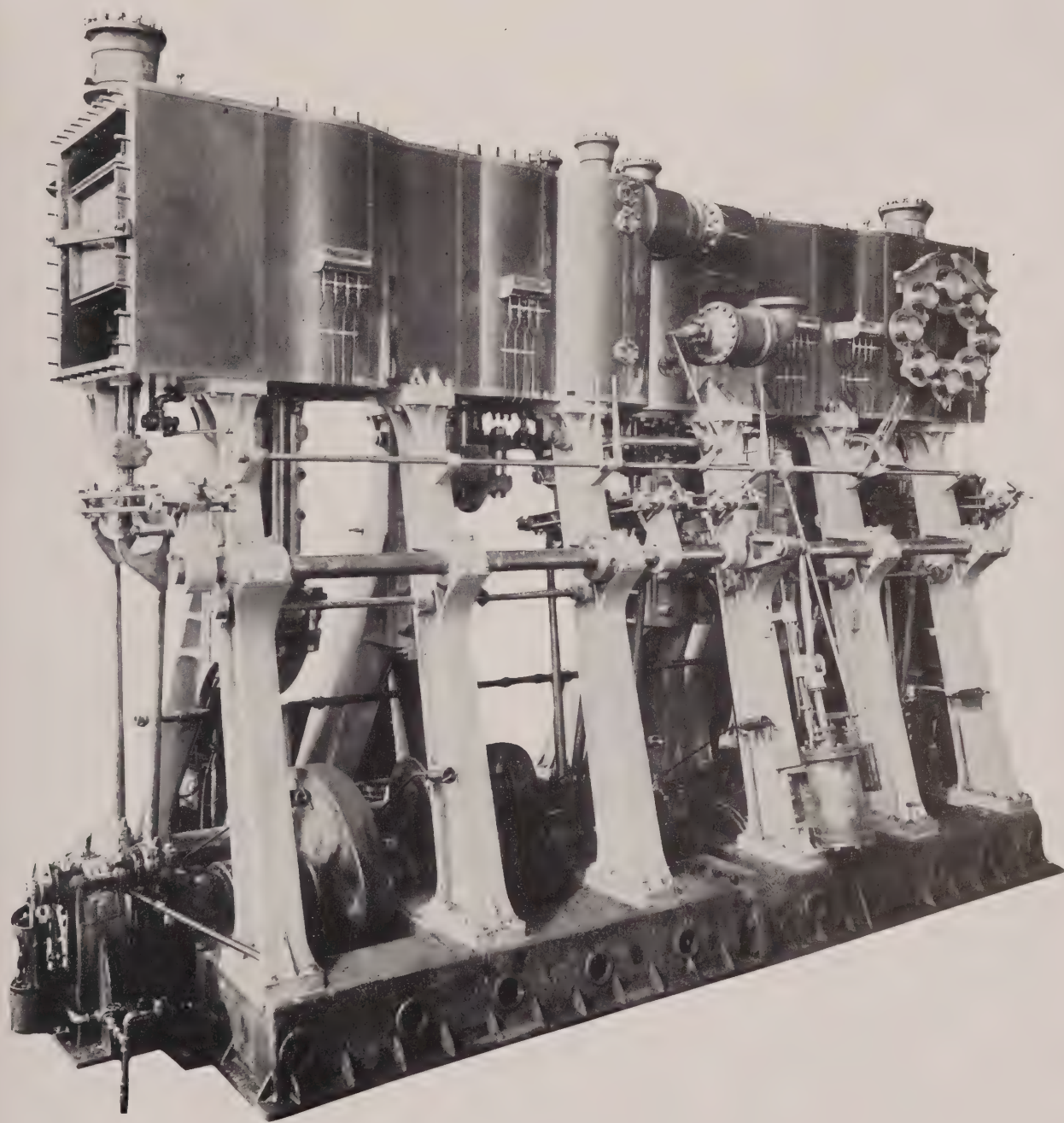


Triple-Expansion Engine Steamer "W. Grant Morden"

This engine has been placed in most of the largest size of lake freight boats for ore carrying. The cylinders are 24-39-65 x 42-inch stroke and develop about 2000 I. H. P. The L. P. and intermediate valves are fitted with Lovekin patent assistant cylinders, and an Edwards patent air pump, 36 inches diameter by 15 inches stroke, is driven from the high pressure crosshead. This engine is entirely standardized. Besides this size, there are also built the following standard sizes of the same general type:

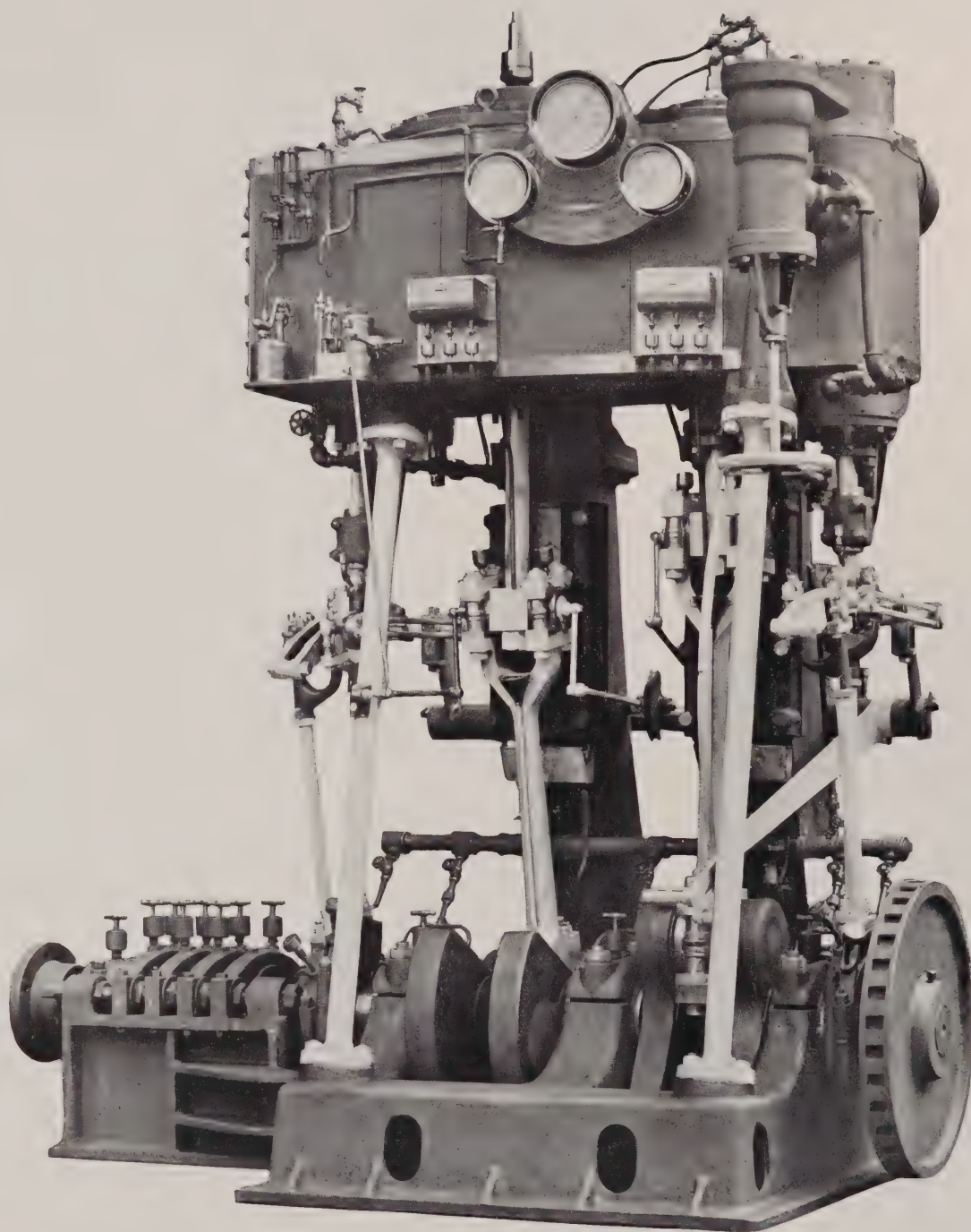
23½"-38"-63"x 42"	22"-35"-58"x 42"	20"-33"-54"x 40"
22½"-36"-60"x 42"	20"-33½"-55"x 40"	

Other smaller sizes of both triple and quadruple engines are also made to suit special services.



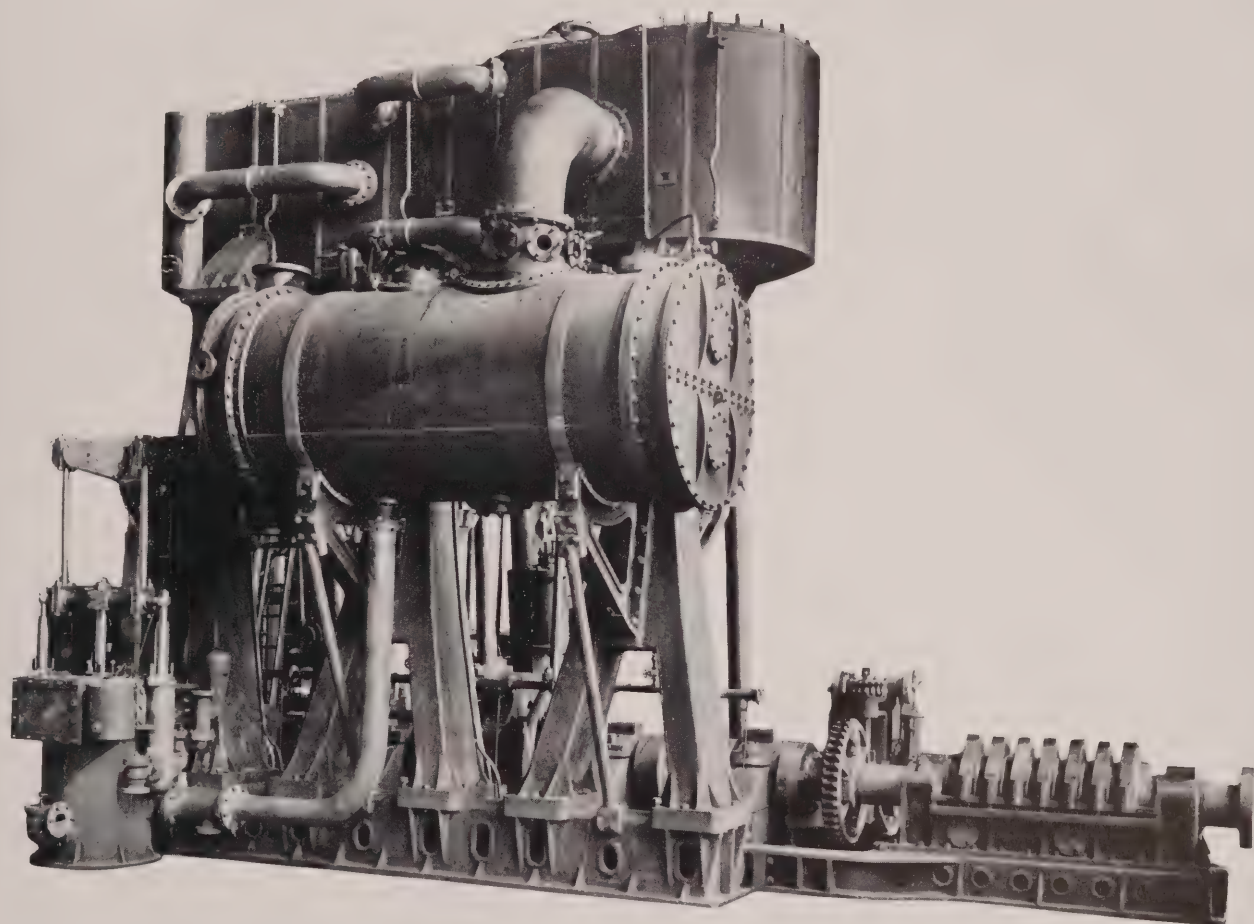
Four-Cylinder Triple-Expansion Engine of Steamer "City of Grand Rapids"

3500 H. P. cylinders are 26-42-51-51 x 42-inch stroke. Photo taken while the engine was on the erecting floor. This engine is similar in design and construction to the engine shown on page 58, except that all the pumps are independent instead of being attached to the engine.



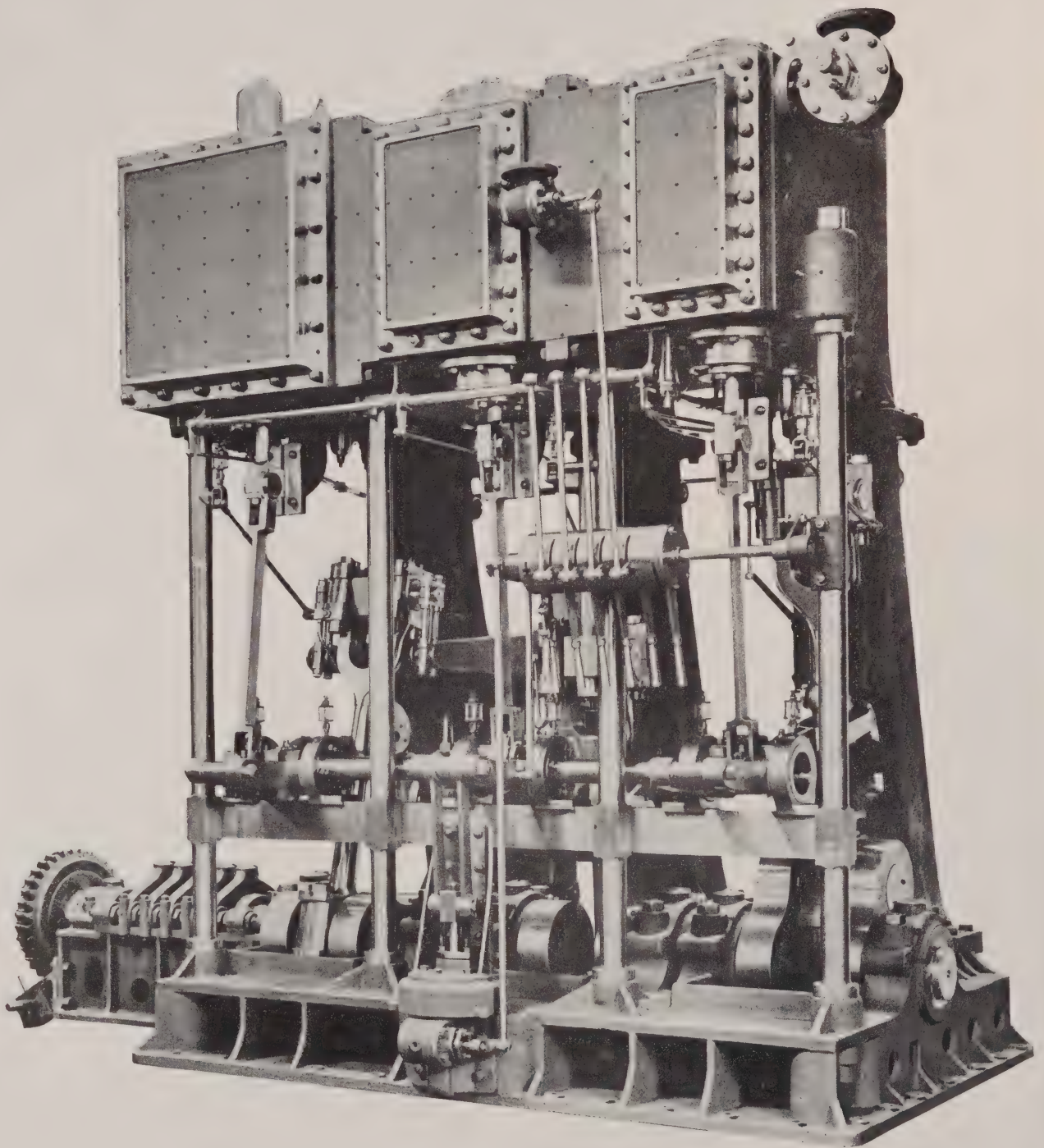
Compound Engine

Compound engines are built in all sizes and types. The one illustrated has cylinders 12 x 26 x 18-inch stroke, and is fitted in a steel tug for the Canadian Pacific R. R. Co.



Engine for Ocean-Going Oil Tank Steamer "Comet"

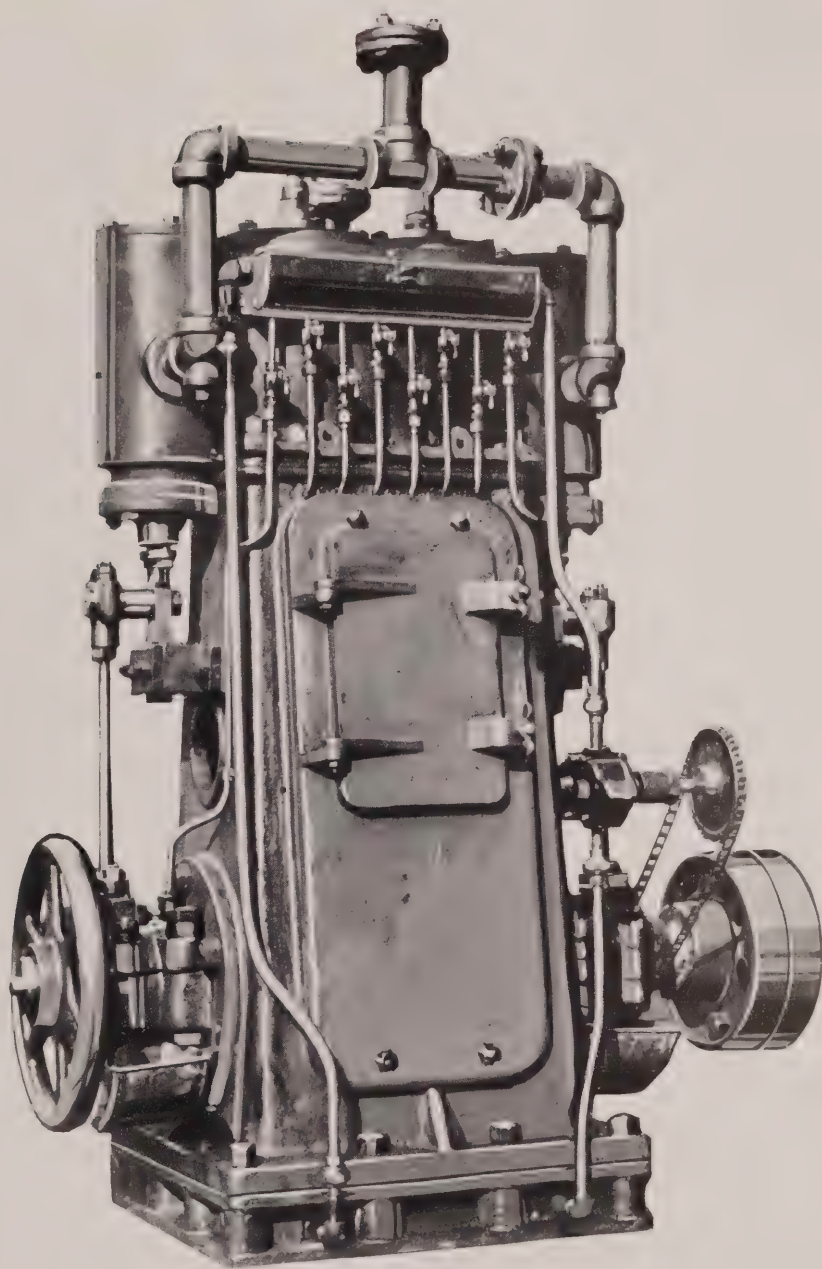
Cylinders, 19-31-54 x 42-inch stroke. Fitted with surface condenser for salt water. Five engines have been built from this set of patterns.



Triple-Expansion Engine

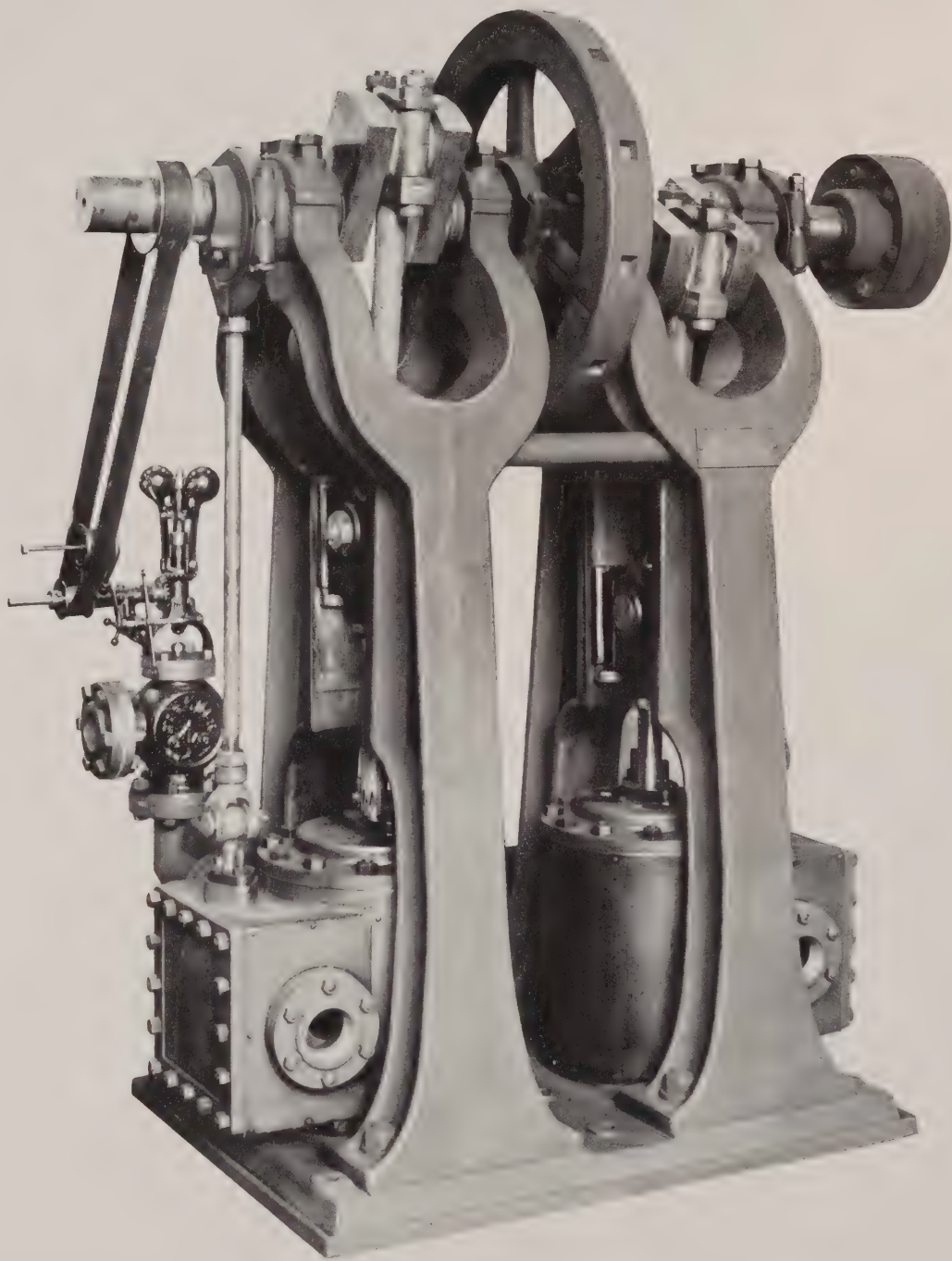
Open front type of engine for Steam Yacht "Comanche"

500 I. H. P. Cylinders, 14-23-36 x 24-inch stroke. Several engines of this size have been coupled directly to dynamos and motors for power and lighting systems.



Fan Engine

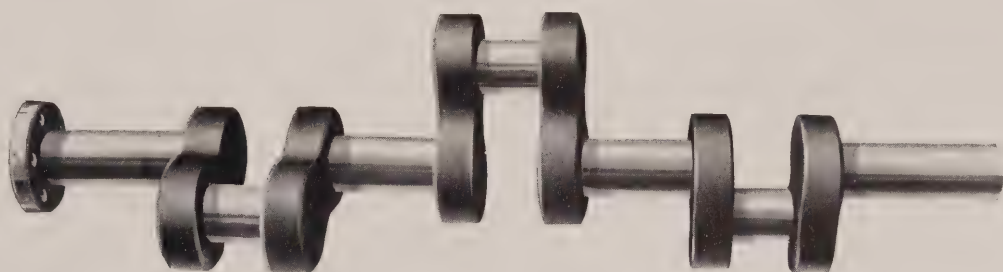
Double 6 x 5-inch engine for driving fans for Ellis & Eaves Induced Draft, equipped with forced lubrication apparatus, which stops feeding oil when the engine is stopped. Adjustable brass connections and bearings throughout, piston valves and all parts easily accessible from front and back.



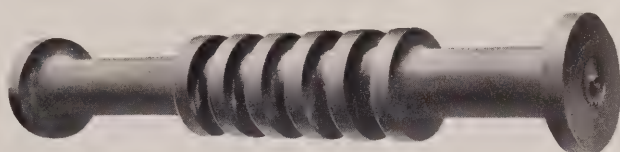
Cargo Hoisting Engine

Double 12 x 12-inch engine for hoisting cargoes from ship's holds. The engine is connected to a line shaft on which are drums opposite or over each hatch and gangway. This shaft runs the full length of the cargo space and by suitable tackle, package freight, bales, timber, etc., are hoisted from the hold to deck or loaded into the hold. A smaller size engine, 10 x 10 inches, is also made for this purpose. This engine fitted in Steamer "Noronic."

Large Forgings



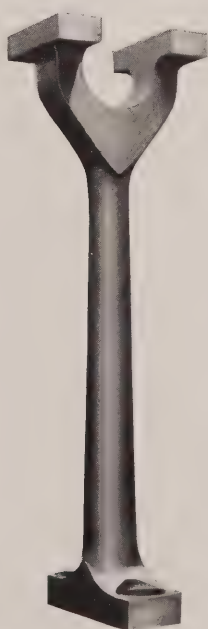
Crank shaft for triple-expansion engine, $12\frac{1}{2}$ inches diameter by 18 feet 1 inch long.



Thrust shaft for triple-expansion engine,
 $12\frac{1}{2}$ inches diameter by 11 feet 1 inch long.



Propeller shaft for triple-expansion engine, $13\frac{1}{2}$ inches diameter, 17 feet 8 inches long.



Connecting rod for triple-expansion engine,
6 feet 8 inches long, 7 inches diameter at butt.



**Ocean Types of Rudder and Stern
Frames Forged and Finished
in Our Own Shops**

Weight of Rudder Frame, 15,600 lbs.

Weight of Stern Frame, 16,350 lbs.



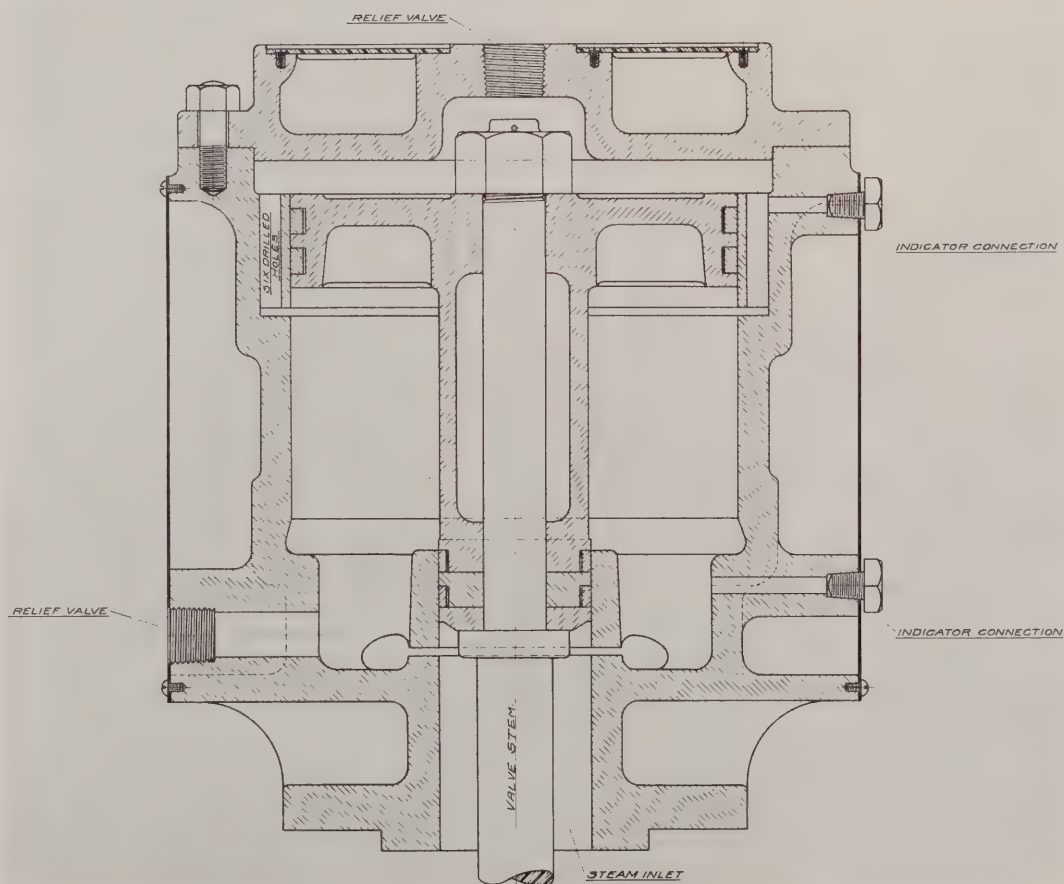
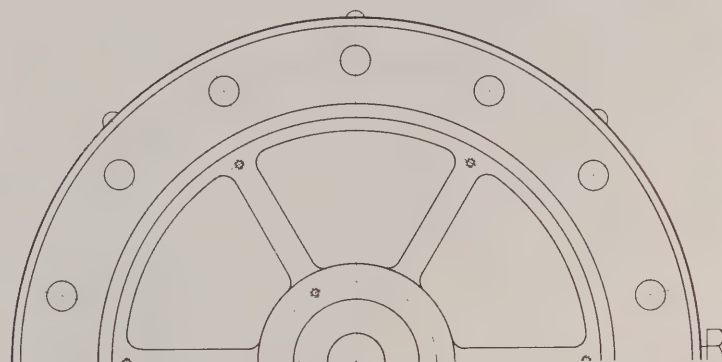


Rudder and Stern Frames For Lake Boats

Weight of Rudder Frame, 16,370 lbs.

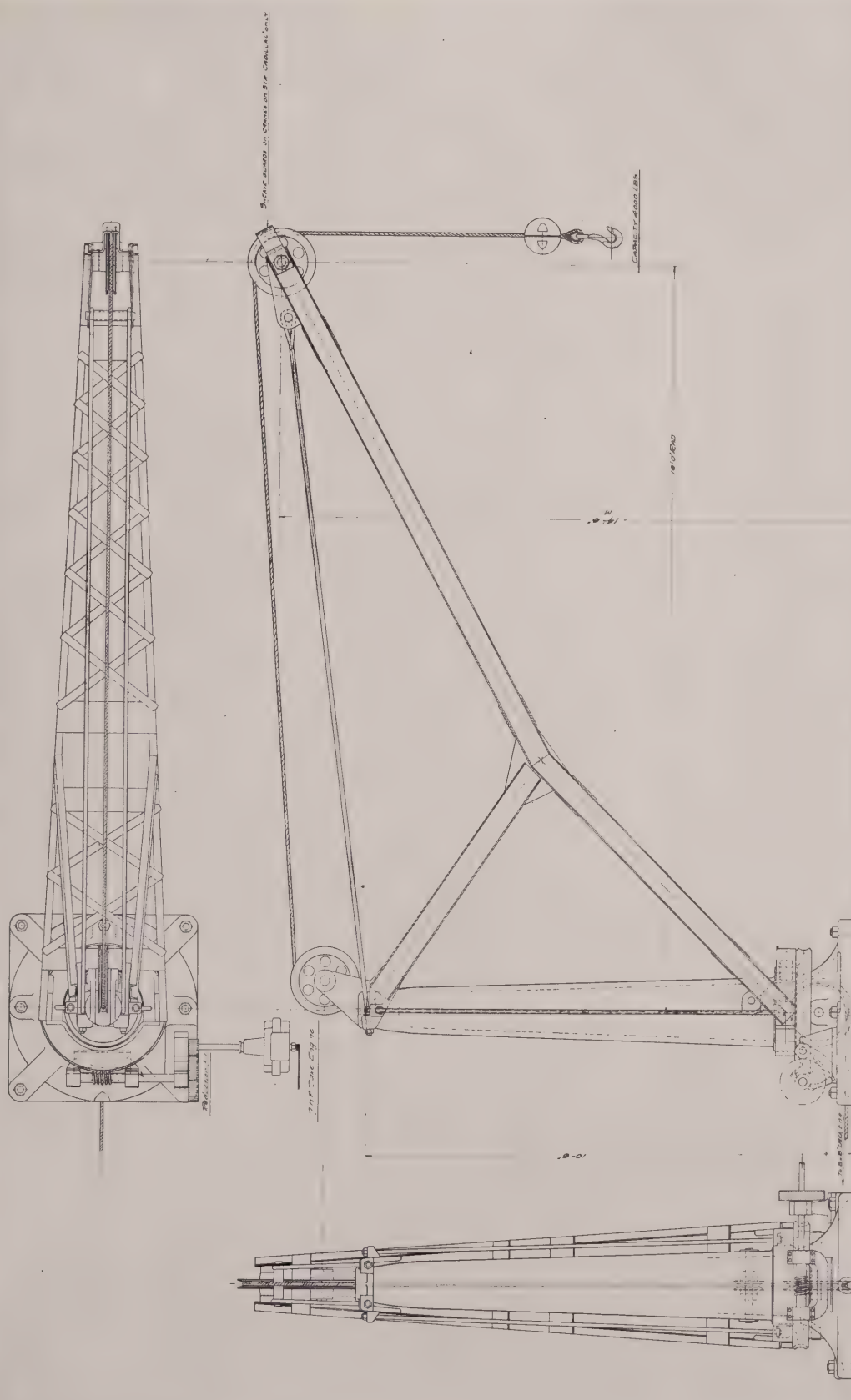
Weight of Stern Frame, 13,350 lbs.





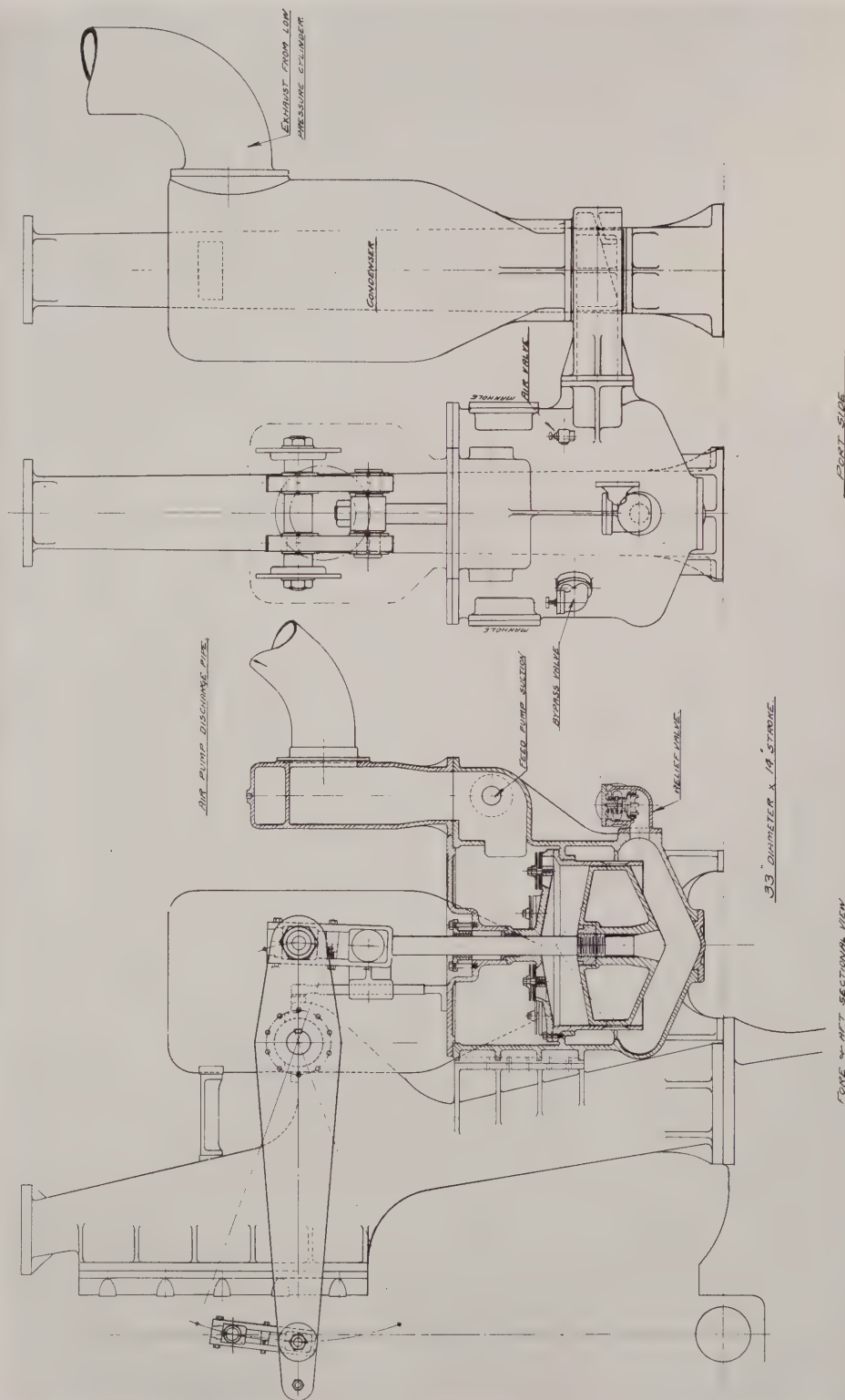
Lovekin Patent Assistant Cylinders

An assistant or balance cylinder designed to take up the weights of the valve gear and piston or slide valve. These cylinders are especially adapted to the heavy low-pressure slide valves of vertical engines but are used also for piston valves and all are designed for a specific valve. A large number are now in successful operation on the Great Lakes steamers as well as salt water.



Two-Ton Deck Cranes

Three cranes of this type were installed on the steamer "Cadillac" and two on the steamer "Pioneer." The center post is hollow and of cast steel, thus insuring great strength and rigidity, and the boom is of structural steel. Hoisting is accomplished by an 8 x 8-inch double deck engine which may also serve as a mooring engine, and a Dake rotary engine is geared directly to the crane for slewing.



Edwards Patent Air Pump

This is an English pump of comparatively recent origin and has proven to be most satisfactory in its work. There are numerous advantages over the old-style pump, among which may be noted the following points: All valves are in one plate, thus eliminating the cumbersome and almost inaccessible foot and bucket valves of other pumps. These valves are of the standard type and easily accessible through the large manholes in the side of the pump. The valve grating may be taken out by removing the top cover of the pump. It will also be noted that the liner is removable, so that when worn out it may be replaced without making an entirely new pump body or even disturbing the pump. A bottom cover can also be removed

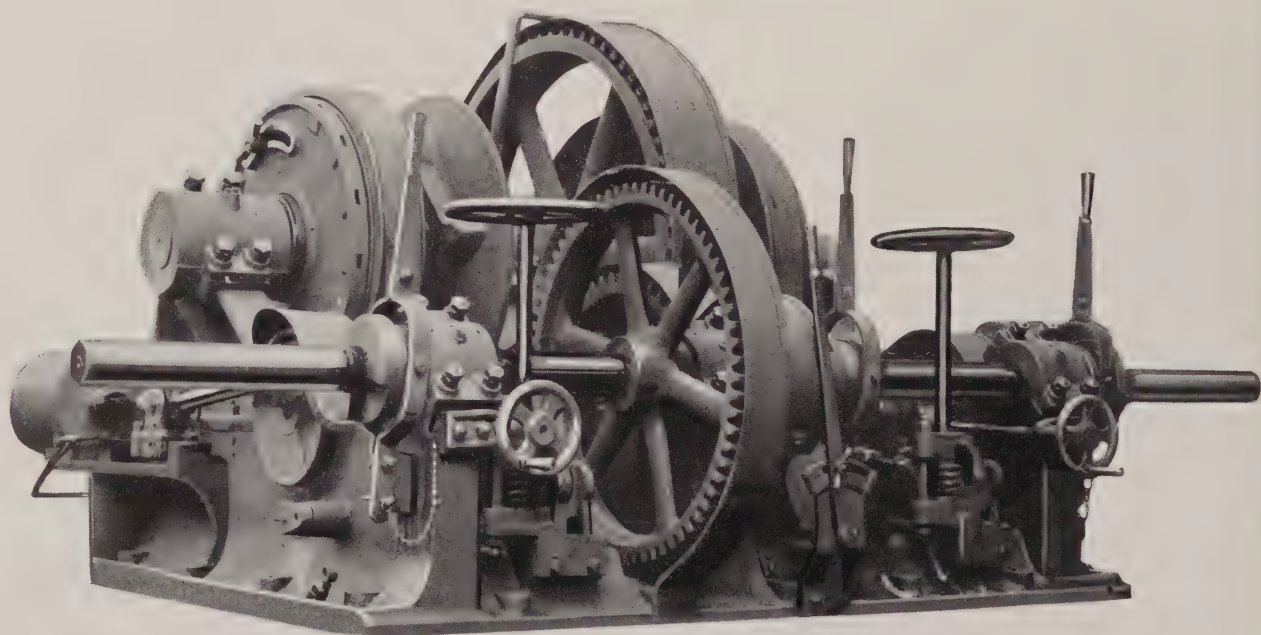
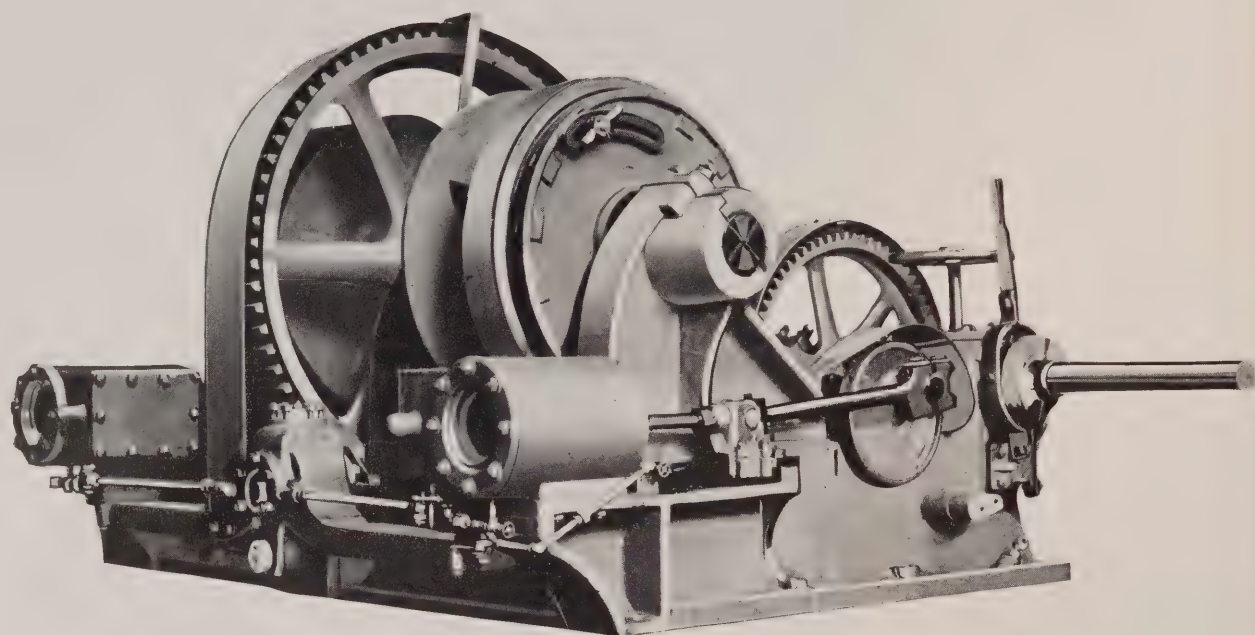
to permit cleaning. One particular advantage is the entire absence of any shock when the plunger meets the rush of the incoming water, this being due to the cone-shaped piston which enters the water like a wedge, and also the vacuum in which the pump works, thus forcing the water to the rounded barrel of the pump where it is deflected through the openings in the liner to the top of the piston. These pumps are fitted with relief and air-check valves and a by-pass valve from the top to bottom chambers. The pumps are usually supported direct from the engine column and connection to the condenser is obtained at the side of the pump body. This Company controls the Great Lakes rights to the Edwards Pump.



Steam Windlass Engines

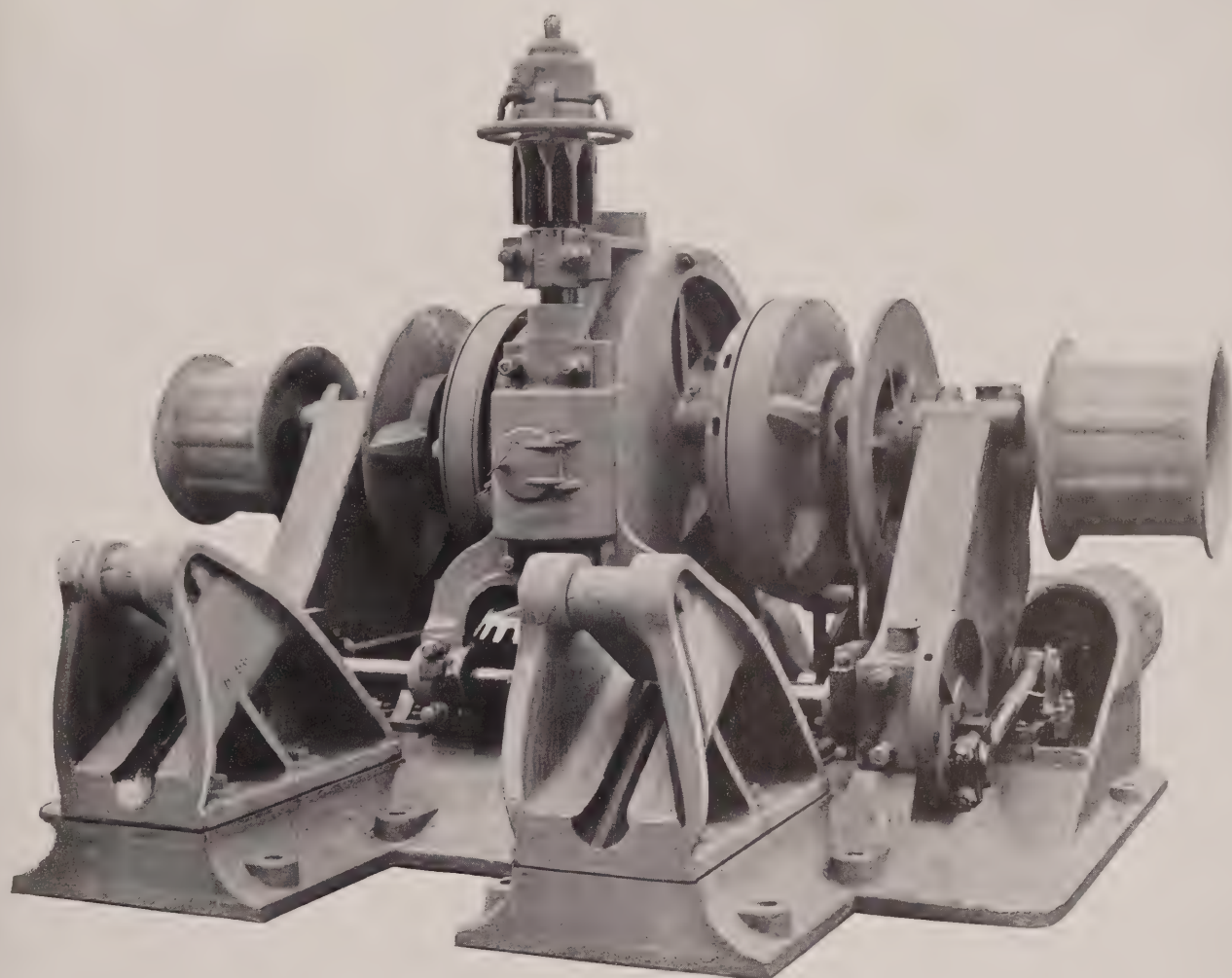
ON the following pages are illustrated some of the windlasses and capstans made by this Company and which range from the small engine used on the canal-size steamers to the largest size capable of hoisting 8000-pound anchors. The 8 x 8-inch, 10 x 10-inch and 12 x 12-inch engines are similar in design throughout and have been used for 20 years on the lakes.

The spur-gear type is a more modern design which is fast coming into use and is made in two sizes, 8 x 8-inch and 10 x 10-inch. The capstan is eliminated in this type, but is replaced by the use of winch heads for manila line or drums for wire line, and these can be operated independently of the wildcats for mooring purposes. In addition to the windlasses there are also illustrated various types of capstan engines for almost any purpose.



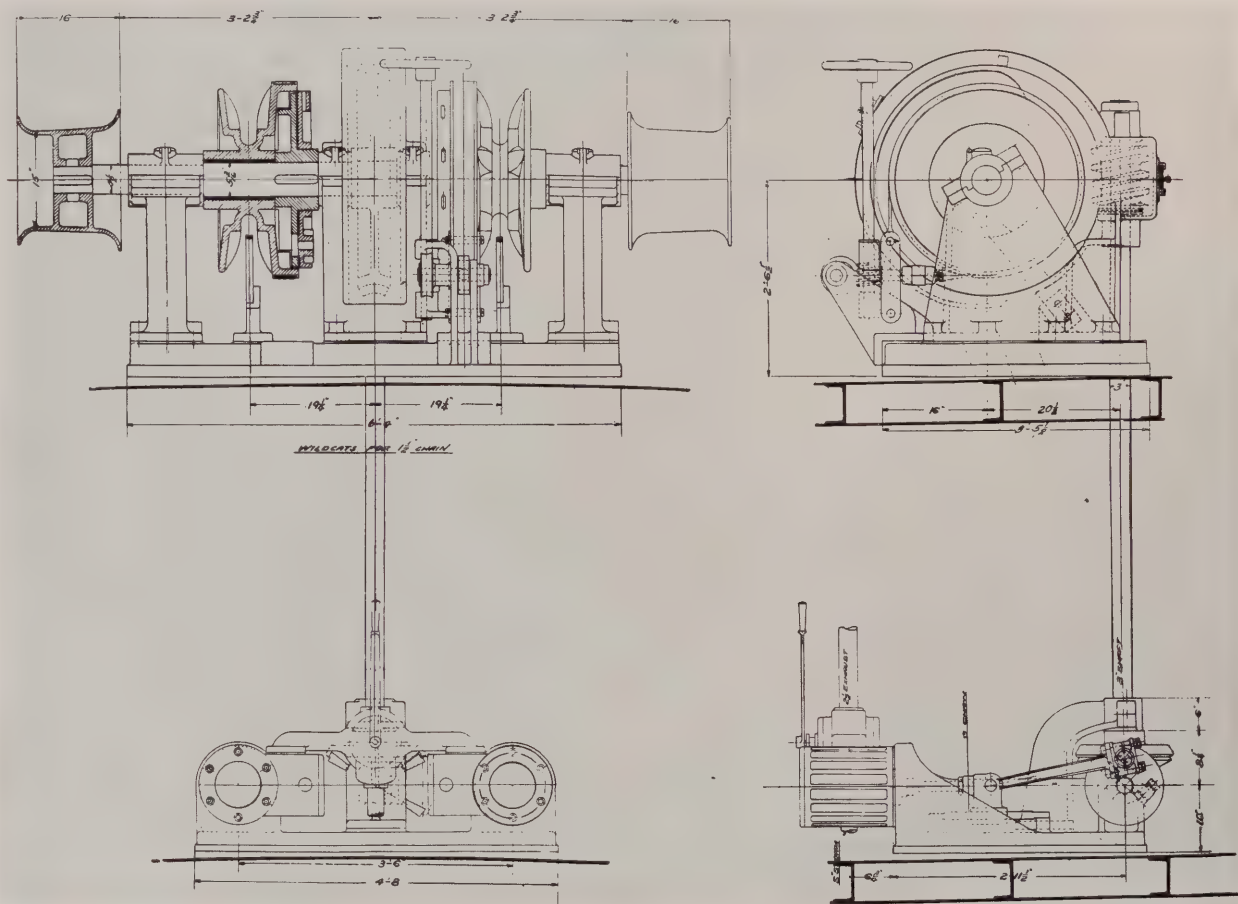
10 x 10-Inch Spur Gear Windlass

A spur-gear windlass of great power and strength for hoisting the largest size anchors. All parts subject to wear are adjustable and the whole machine is designed to be as compact as possible, all parts being very accessible. The bed plate is in one piece, substantially made and well ribbed, and carries the facings for attaching cylinders and guides. The engine is reversible by means of the reversing valve between the cylinders, thus doing away with the use of links. All the gears with the exception of the clutch gear are of cast steel. The wildcats are of the usual type in these machines and can be locked or unlocked by one motion of the lever. A brake band is fitted to each wildcat, operated by a worm and hand wheel. All shafting is of steel and gears or wildcats are easily removed by taking off the journal caps. Winch heads were removed so as to show engine clearly. This type is also made in a smaller size with 8 x 8-inch cylinder.



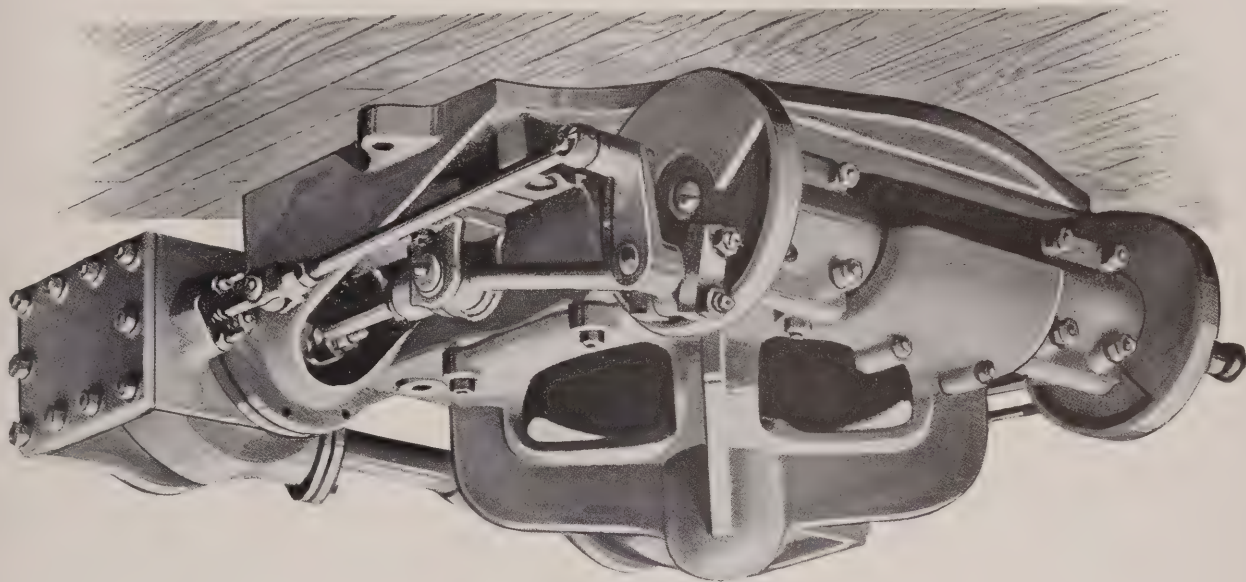
10 x 10-Inch Globe Windlass

A large number of engines of this size have been fitted to lake boats in the last twenty years. The pictures show the construction in detail. The bed is cast large enough to support the chain stoppers, thus being very rigid, and the frames are firmly bolted to the bed. The wildcats can be locked or unlocked by one motion of the lever and are supplied with brakes. The engine is fitted with steam reverse valve and is well supplied with gear guards and housings. All wearing parts are adjustable. This type of windlass is also made in a smaller size with 8 x 8-inch engines and a larger size with 12 x 12-inch cylinders.



8 x 8-Inch Special Capstan Windlass

A special arrangement of windlass for use where deck space is limited. The wildcats are placed on the deck above the engine to allow more deck space in the forecable and at the same time to allow the anchors and hawse pipes to be fitted above the water line.



8 x 8-Inch Capstan Engine

This capstan is made in several different forms:

Type "A" with engine on one deck and capstan on deck above.

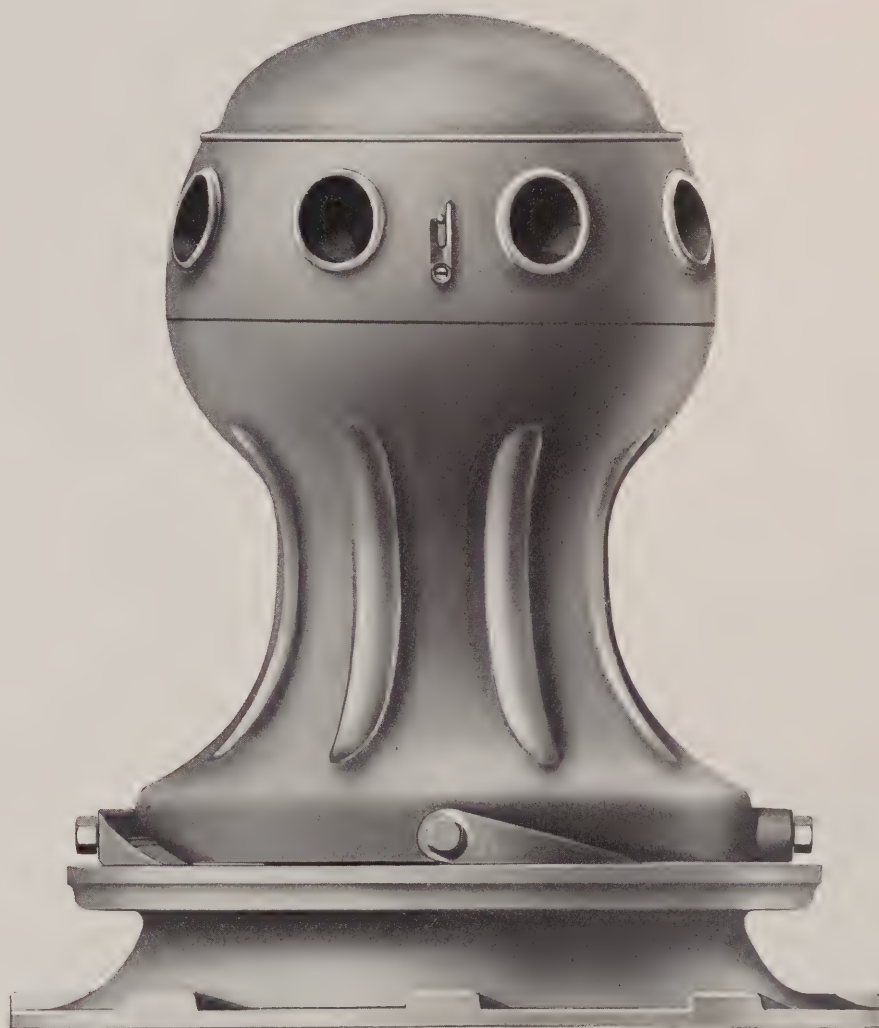
Type "B" same as "A" except that a wildcat for chain is fitted between the deck and capstan barrel.

Type "C" with engine on deck and capstan mounted directly upon the engine.

Type "D" with engine on the under side of deck and capstan directly over it above deck.

The bed plate and crank shaft bearings are cast in one piece, thus forming a rigid base to receive the strain from the capstan. The engines are double and the cylinders connected by a combined steam and exhaust reversing valve, which may be operated from any point as may be convenient. All pins and bearings have liberal wearing surfaces and are adjustable. This type is also made with cylinders 6 inches in diameter by 8-inch stroke.

The cut above shows the engine for Type D.



Capstans

Standard Capstans are carried in two sizes: 11½ inches diameter and 14 inches diameter measured on the smallest part of the barrel. The 11½-inch capstan is 39 inches high and the 14-inch capstan 42¾ inches high. They are substantially built and well ribbed inside for strength, the barrel and base being of cast iron, the ratchet pinions steel, and the cover polished brass.

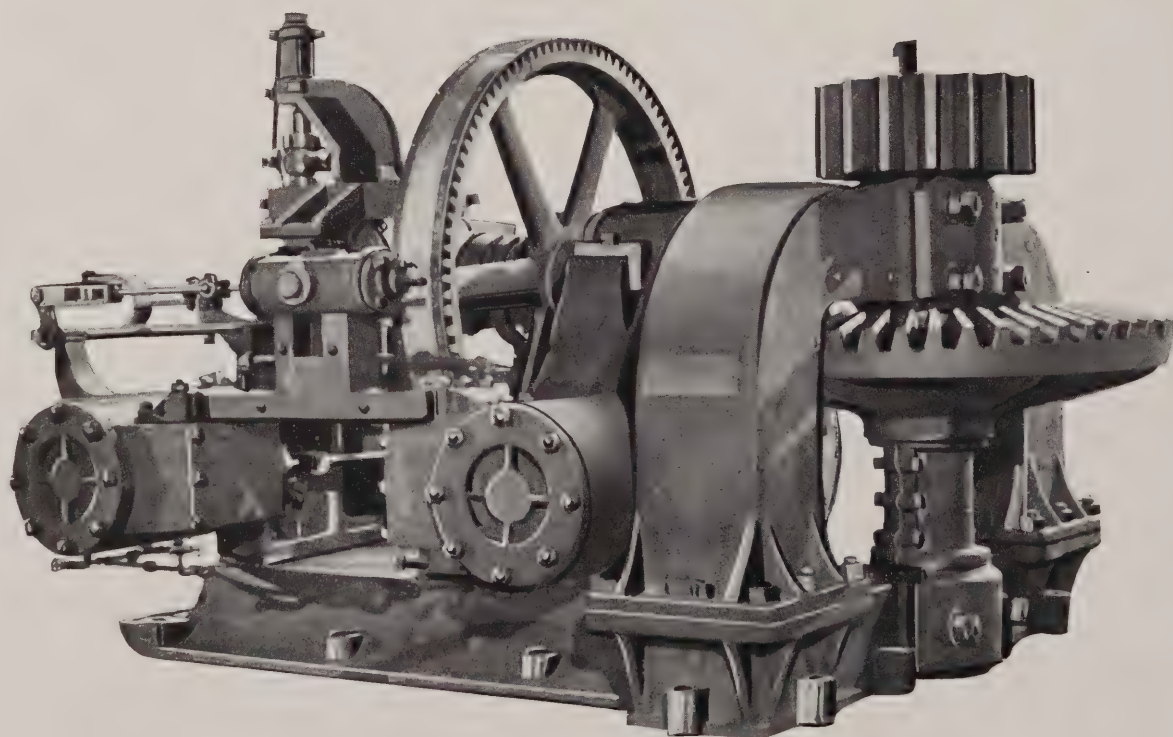
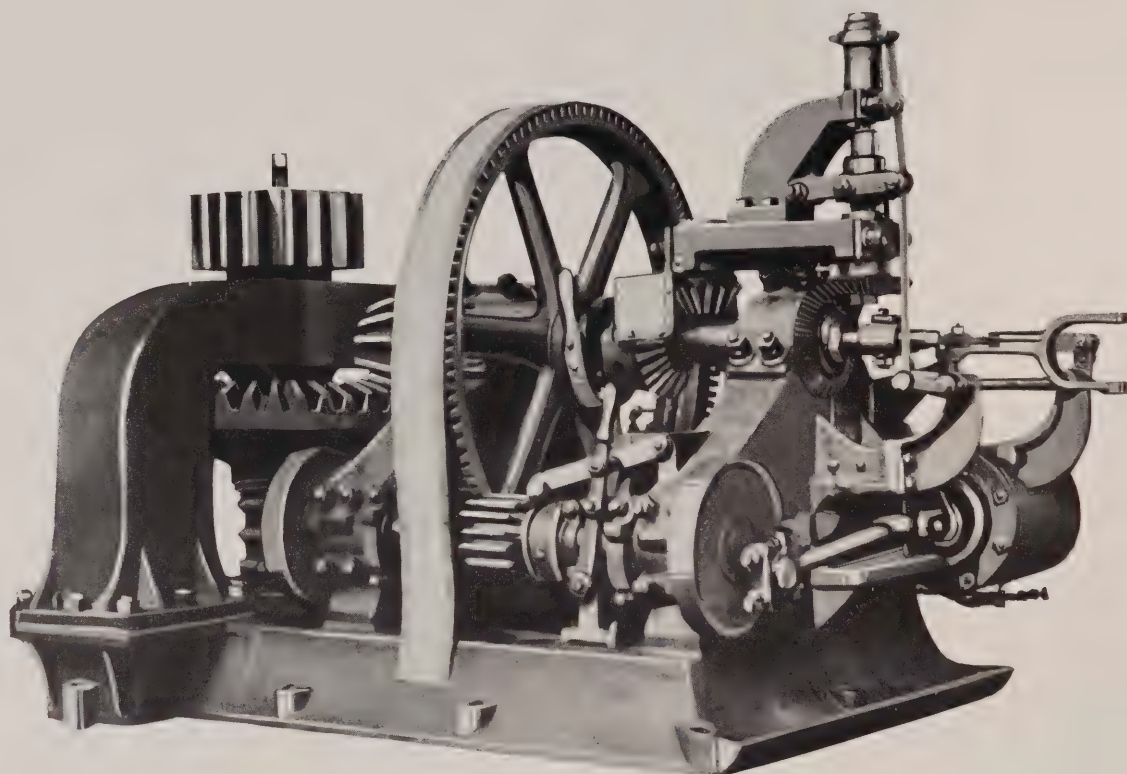
All parts are carried in stock.

Steam Steering Engines

THE various sizes of steam steering engines embrace those in use on the largest freight boats down to the smallest types suitable for very small boats. These different types will be found on the following pages.

These engines have been in use many years, on the Great Lakes principally, and have been found to be the best engine for this purpose. All parts are substantially made and built for hard service, all bearings being adjustable and with large wearing surfaces, each part having been designed with accessibility in mind as well as durability. Especially is this true of the latest type, the direct-acting engines. As will be noticed, these are geared directly to the rudder quadrant, having cut teeth on all gears and with the rack teeth on the quadrant in three interchangeable segments.

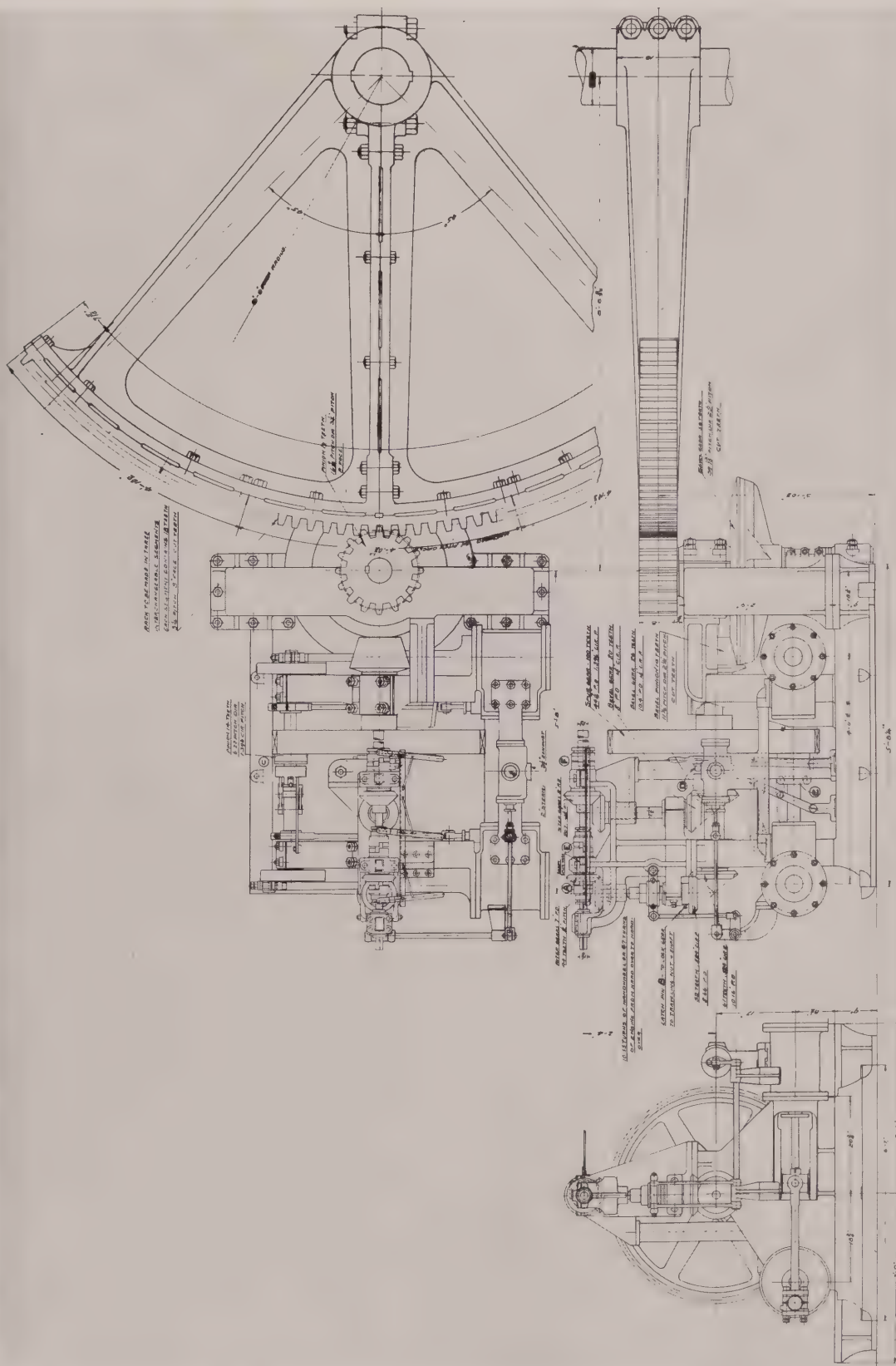
This type of engine eliminates the use of chains, quarterblocks, drums and all their attendant dangers and troubles. Combining this engine with the use of shaft transmission from the pilot house, running in roller bearings, the installation is as nearly perfect and positive in action as can be made. This arrangement has been in use on several boats and has been demonstrated to be the best possible steering gear which can be installed.



9 x 9-Inch Direct-Acting Steering Engine

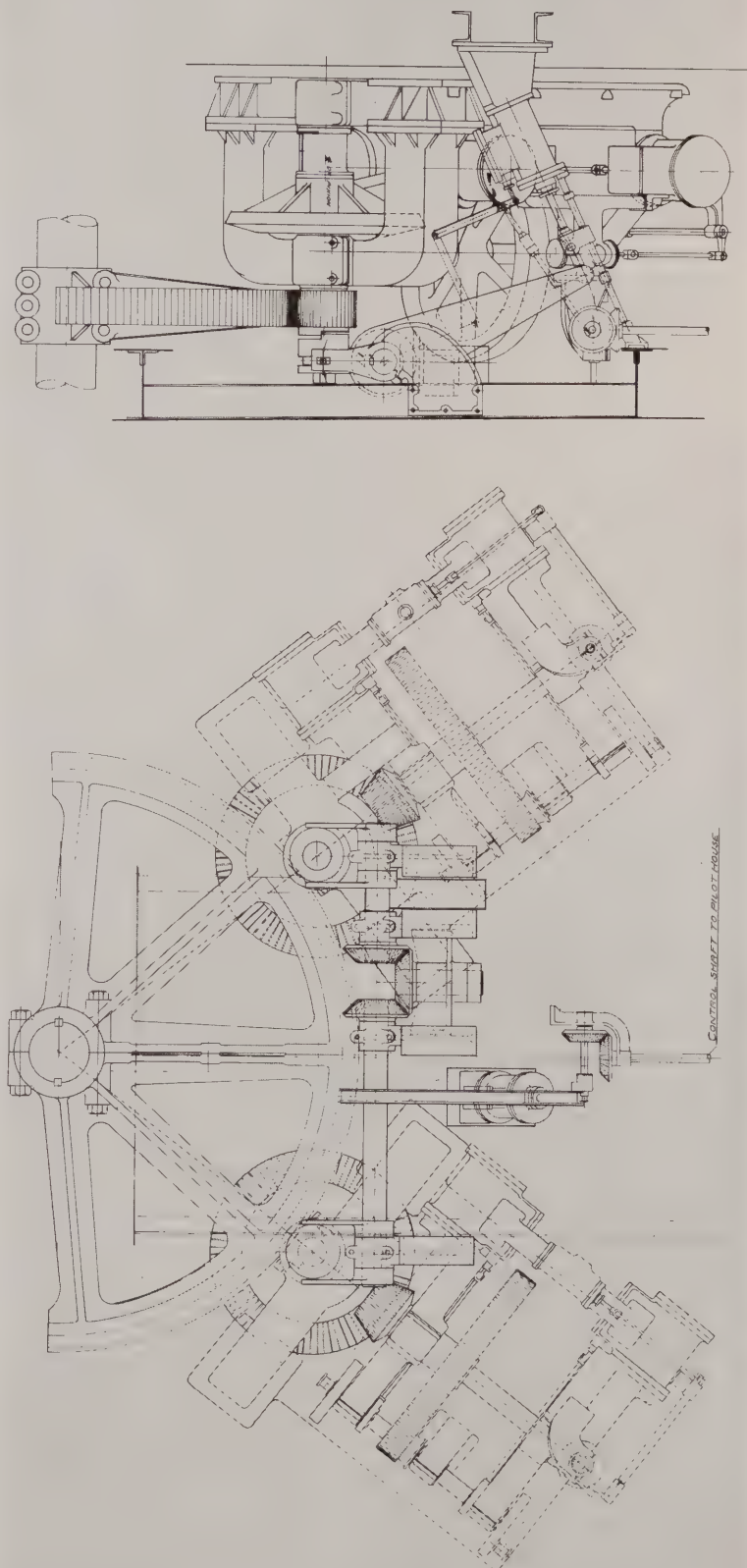
A type of engine which is geared directly to the rudder quadrant. The engine is very compact, adjustable in all bearings, has cut gears and is fitted with or without telemotor and hand steering attachments.

All parts are easily accessible and strongly made. This engine is also made in a smaller size with 8 x 8-inch cylinders, shown on page 83



9 x 9-Inch Direct-Acting Steering Engine—Type No. 6

As used on large size lake boats. This engine is the same general size as described on page 80, excepting that the transmission shafting and gearing are built as a component part of the engine instead of being supported from the upper deck. This method is obviously much more effective, as the shafting and gears are thus properly aligned in the shop when the engine is assembled. This type, as shown above, is designed to steer by steam from pilot house or from aft and also by hand from aft, the various clutches being thrown in or out of gear as may be required for each purpose.



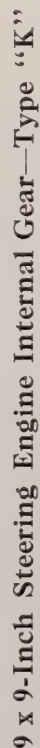
Double 9 x 9-Inch Steering Engine—Steamer "Noronic"

This illustration shows two steering engines geared to the same quadrant. One engine is continually in gear while the other is reserved for emergency. By means of a small steam cylinder fitted with equalizing valve gear, the clutch on one engine may be lifted out of gear, at the same time throwing the clutch on the opposite engine into gear. This shifting gear is controlled from the pilot house by shafting and gears so that at all times the entire steering arrangement is under direct control of the wheelman.

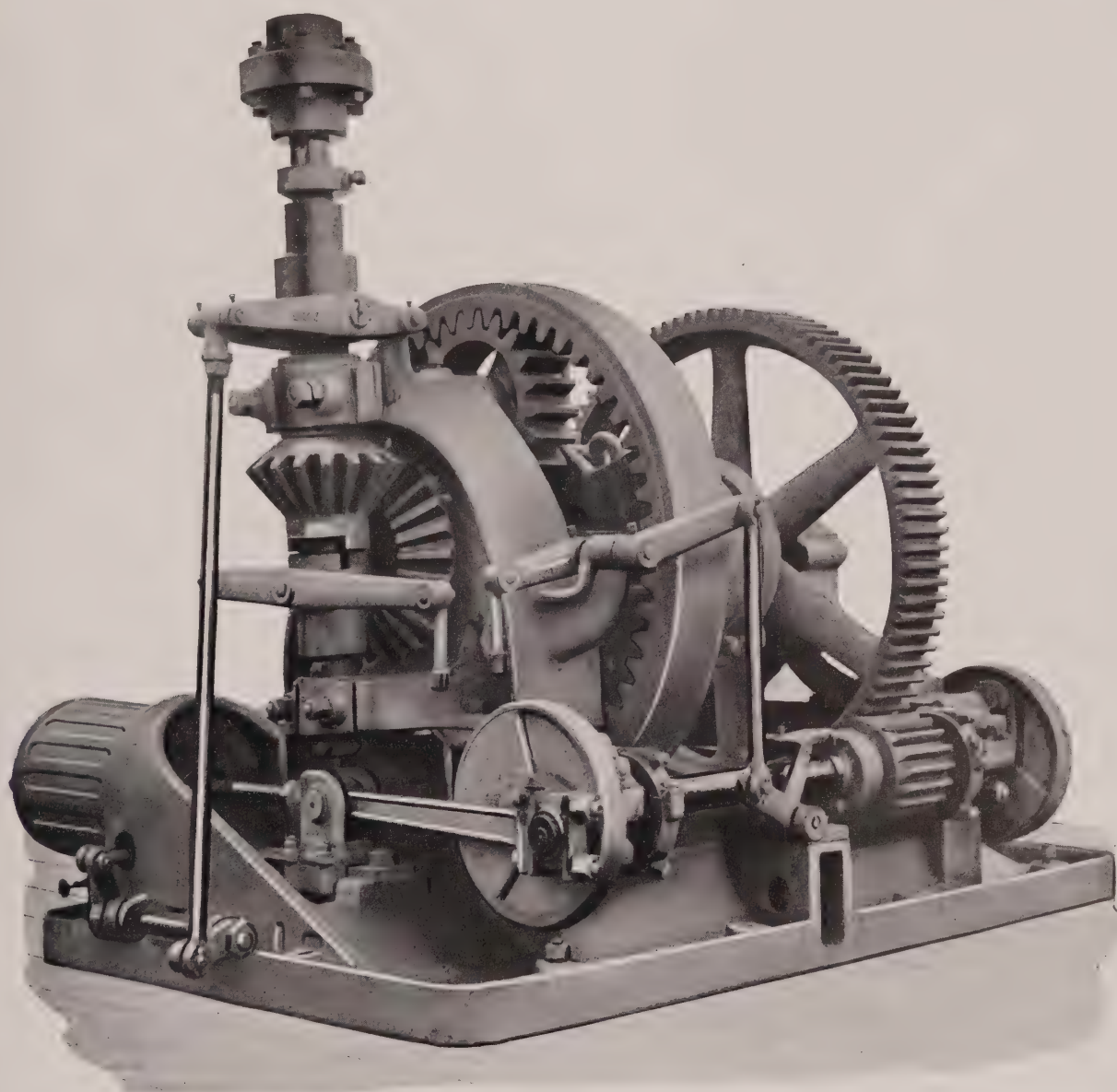


For medium size lake boats. Same general type as shown on page 80, except that it is smaller throughout. This type may also be fitted with the overhead transmission, built directly on the engine, if it is so required.

For medium size lake boats. Same general type as shown on page 80, except that it is smaller throughout. This type may also be fitted with the overhead transmission, built directly on the engine, if it is so required.



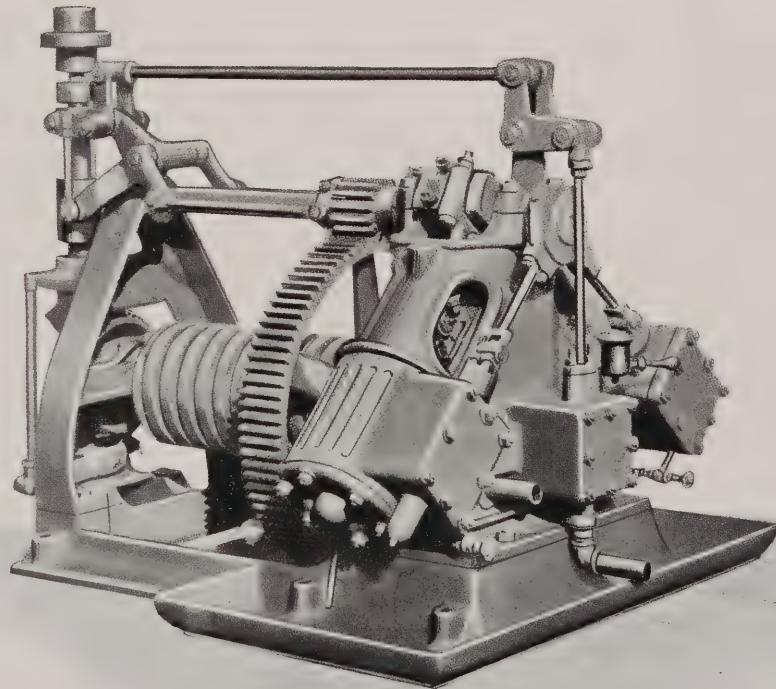
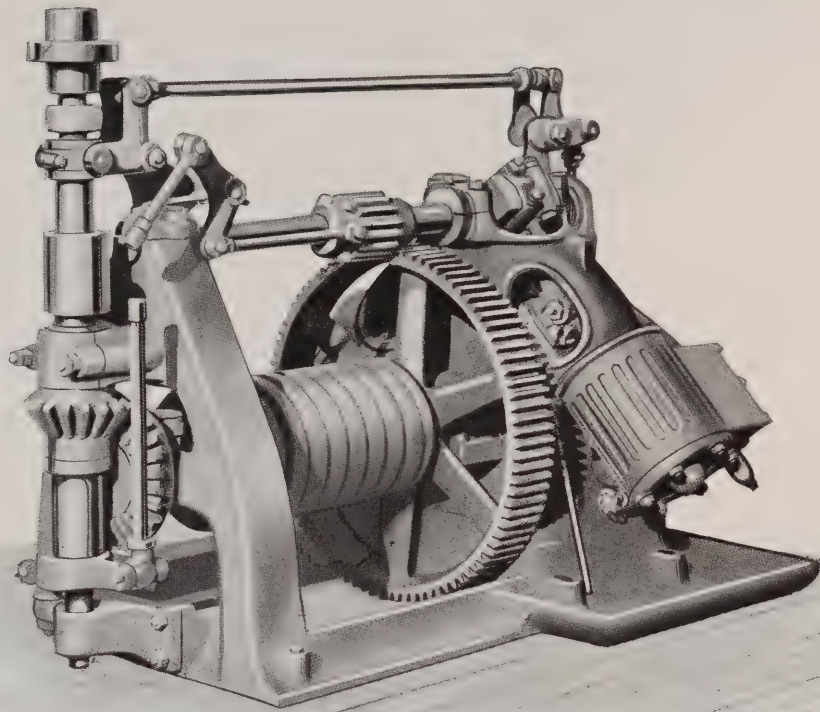
In cases where a direct-gear steering engine cannot be fitted, this type can be installed wherever advisable. It can be fitted with or without telemotor and hand-steering connections. The engine is very strongly built with adjustable bearings throughout, all parts being accessible in case of renewal or for examinations.



8 x 8-Inch Steering Engine

Internal Gear Type "A"

The same general design as described on page 84. For medium size vessels. A smaller size, 4 x 6 inches, in this type is also built for small steamers, barges, etc.



7 x 6-Inch Steering Engine

Internal Gear Style

For vessels up to 250 feet long.



Wheelstands

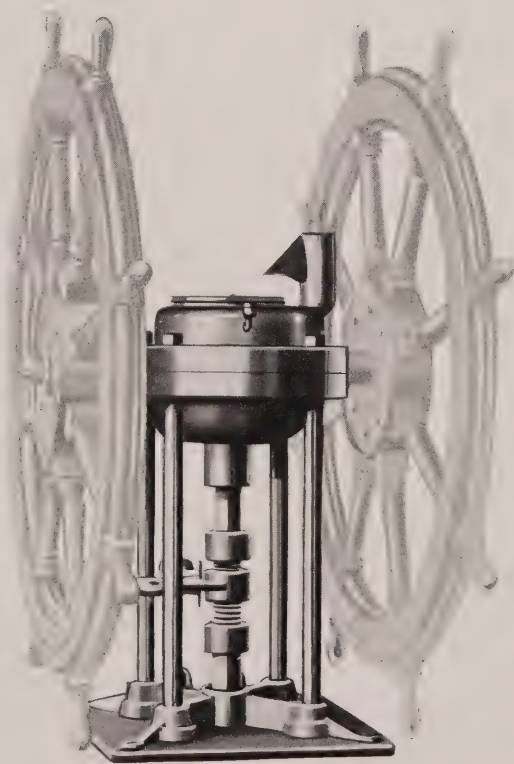
Several different types of wheelstands are regularly made:

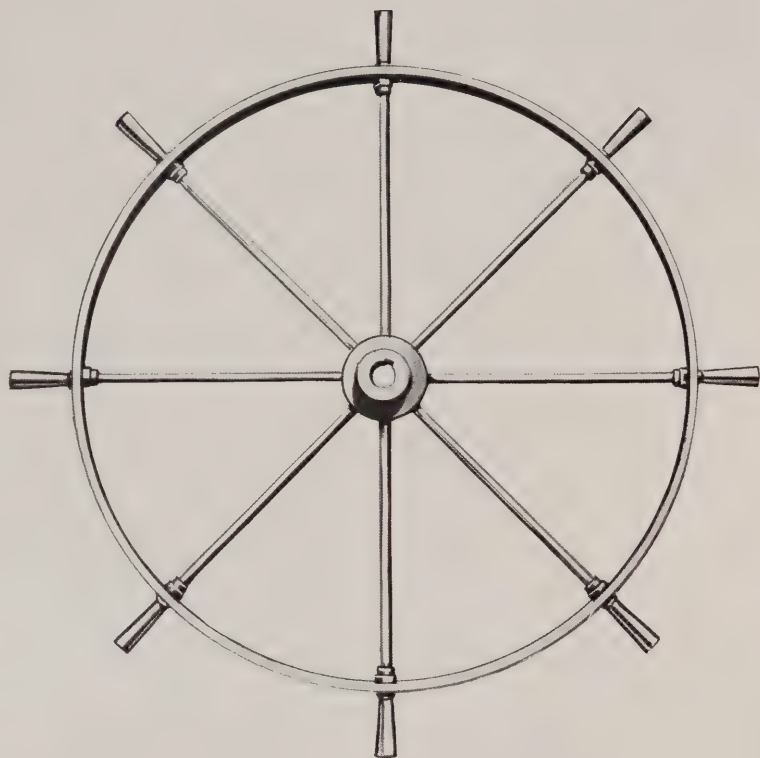
Type "A"—All brass, for steering from the top of pilot house.

Type "A-1"—All of brass and similar to Type "A," as shown, for steering from the inside of pilot house and connected to the Type "A" stand above by a brass shaft and clutch.

Type "B"—Of cast iron for two wooden wheels, 5 feet 3 inches diameter, which can also be connected with a brass stand above.

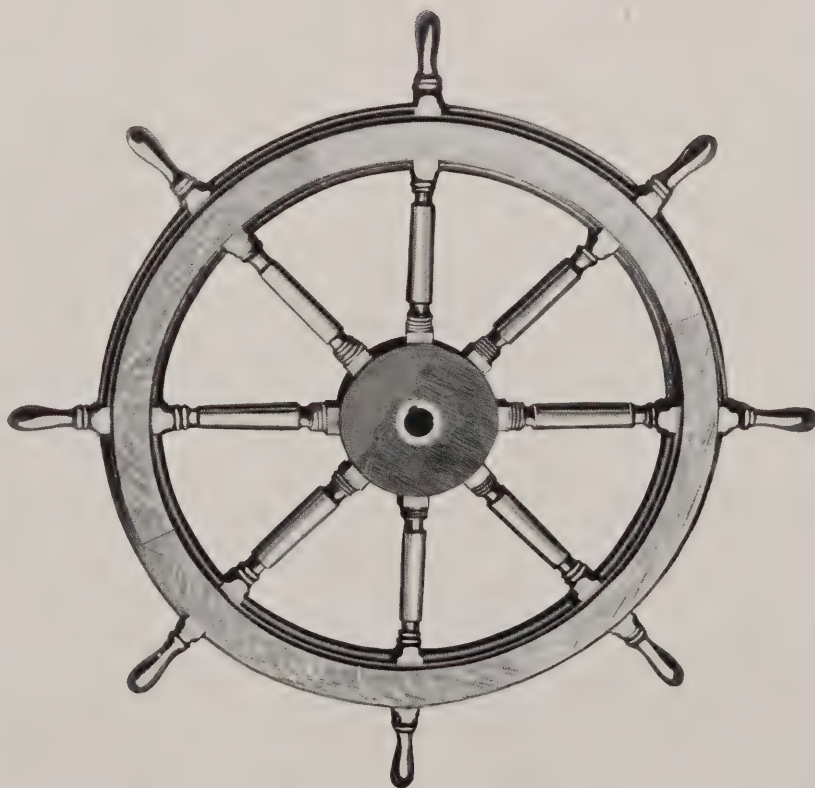
Type "C"—All of brass, as shown, and otherwise the same as Type "B." Made to order only.





Steering Wheels

Wooden wheels, 5 feet 3 inches diameter and 4 feet 6 inches diameter. Made of oak with hickory spokes, brass hub, and highly polished. All brass wheels made 19, 33, 48 inches diameter, polished.



Deck and Hoisting Engines

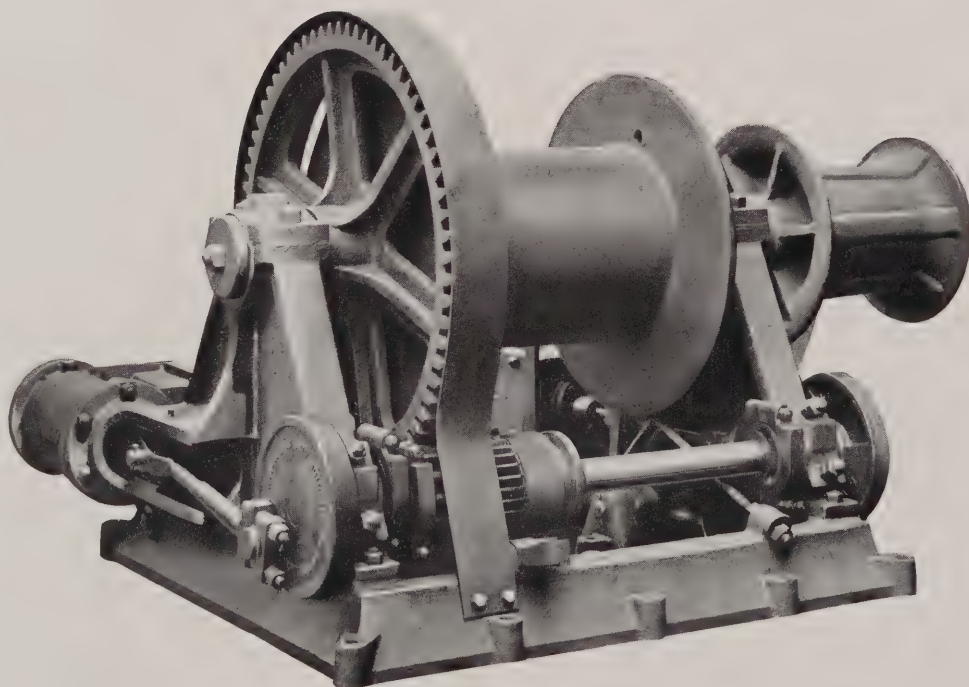
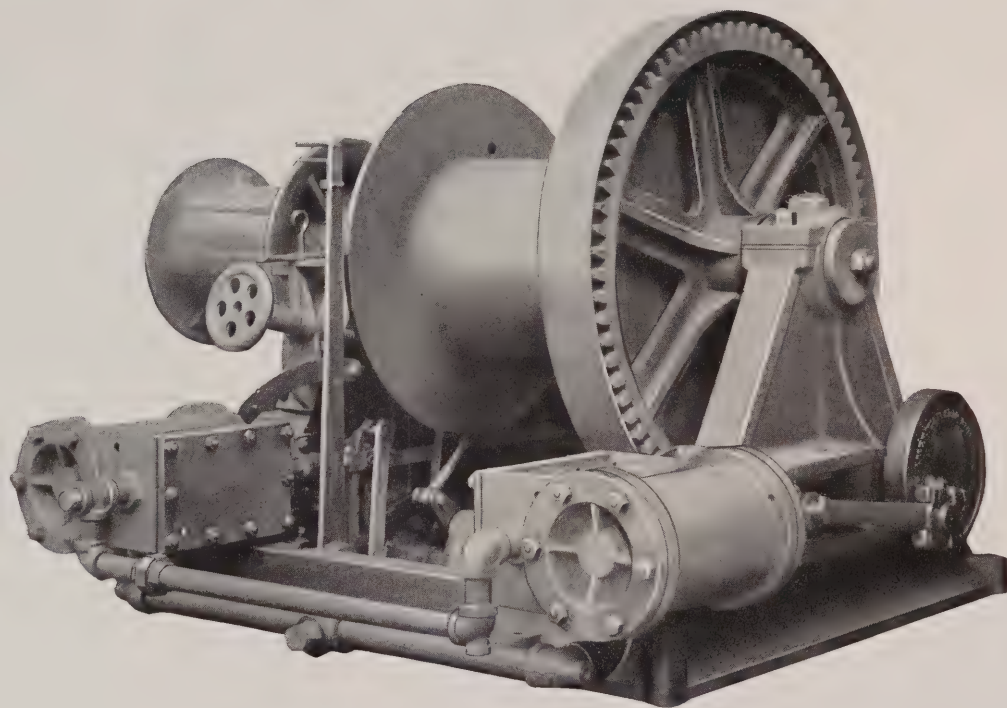
DECK and hoisting engines are built in a variety of sizes and types suitable for all the needs of modern boats for mooring and other purposes. All parts are standardized and can be identified by the numbers stamped or cast on the piece. In ordering parts for renewal always state this number and, in the case of gears, give the number and face of teeth and the diameter and bore. Most parts are carried in stock and can be supplied on request.

Mooring engines are built in two sizes—8 x 8-inch and 8 x 10-inch. All double-cylinder type.

Engines for operating steel telescope hatches on ore boats and for mooring small boats, small anchor hoists and other purposes, are made in two sizes—5 x 6-inch and 6 x 6-inch, double cylinders.

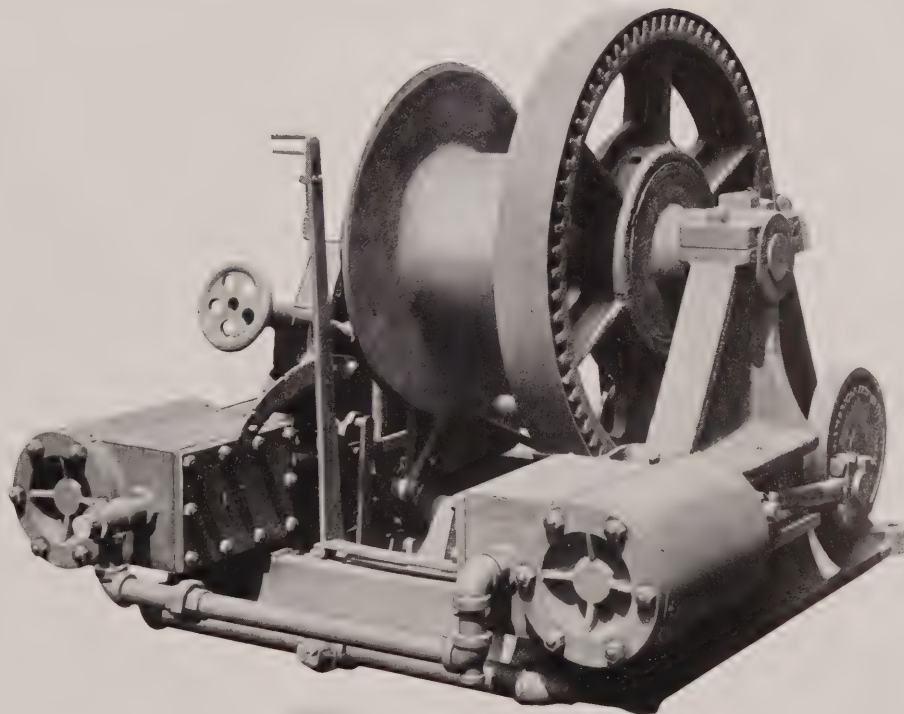
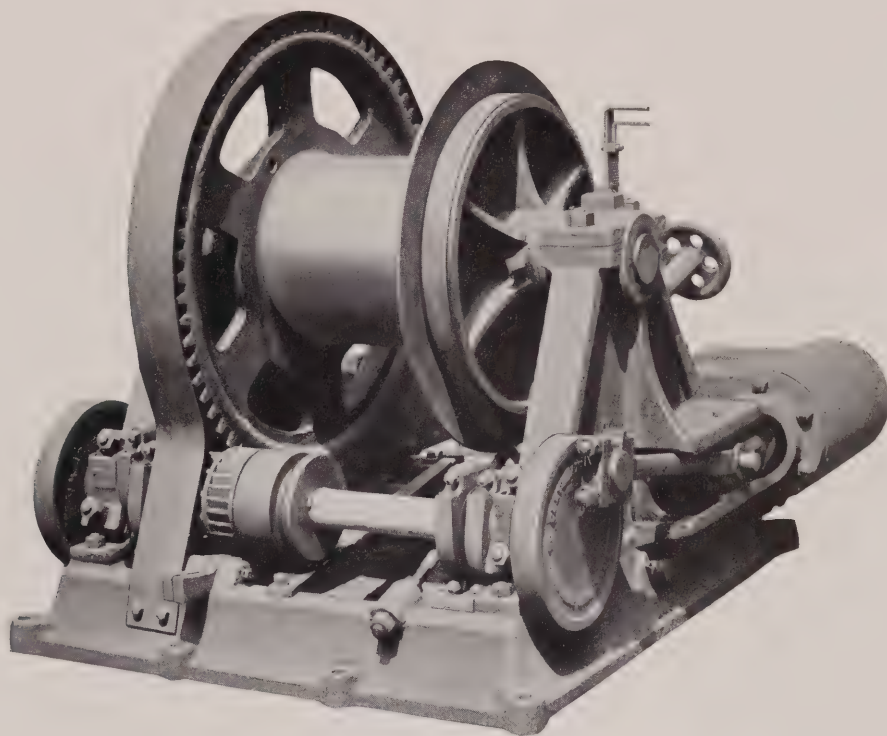
All parts of all engines are substantially built, adjustable as to wear and fitted with gear guards, etc.

On the following pages will be found illustrations of several different types of engines, which clearly show the construction details.



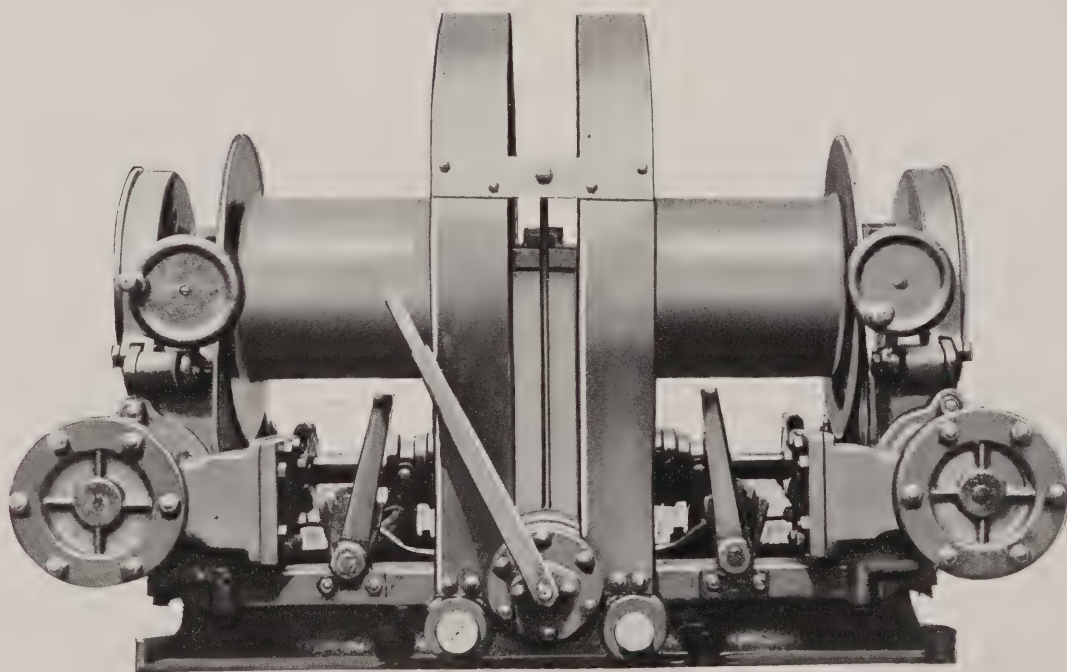
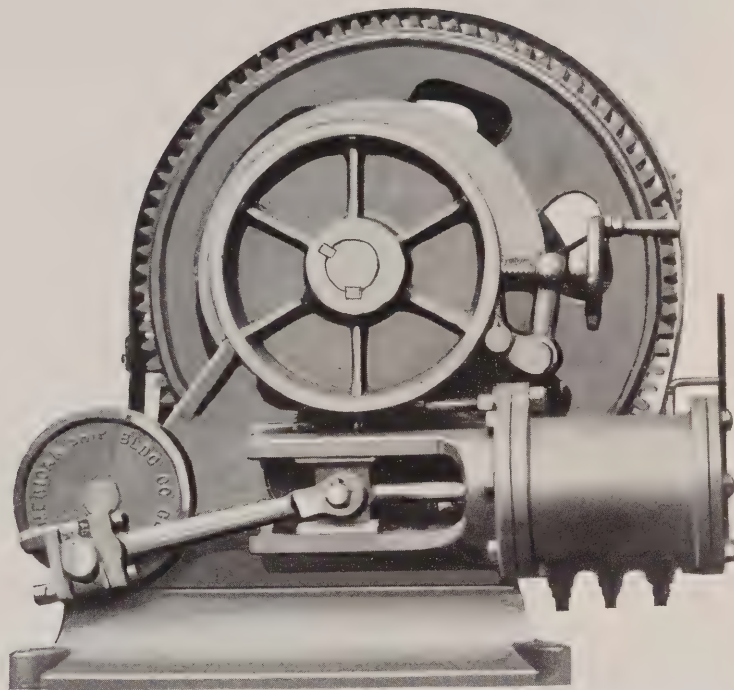
8 x 10-Inch Single-Drum Type "SSS" Deck Engine

A double-cylinder engine used principally on the after end of the largest size ore boats for mooring. Fitted with one winch head and the usual hand mooring gear. The main drum is operated by a clutch keyed to the shaft.



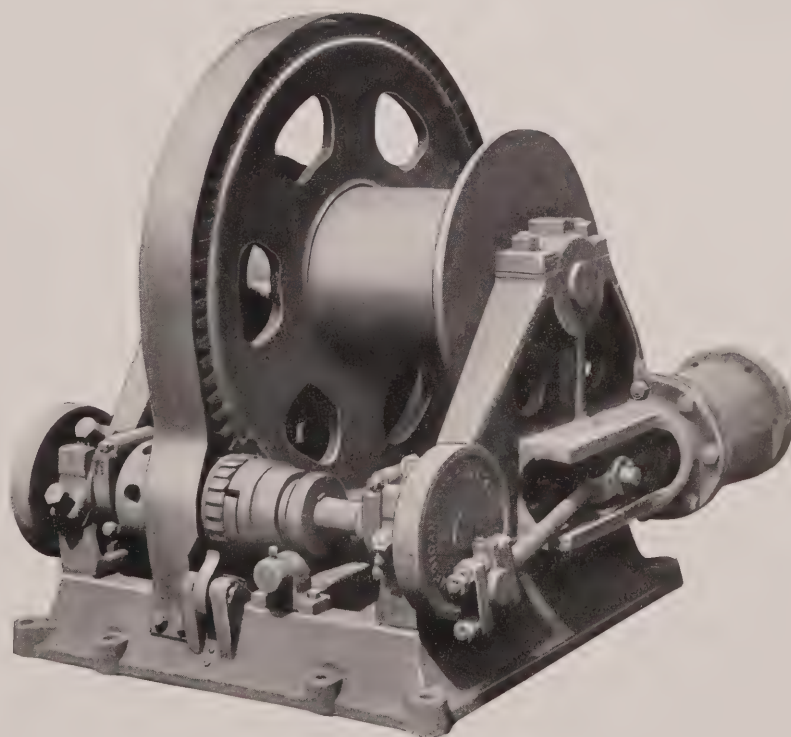
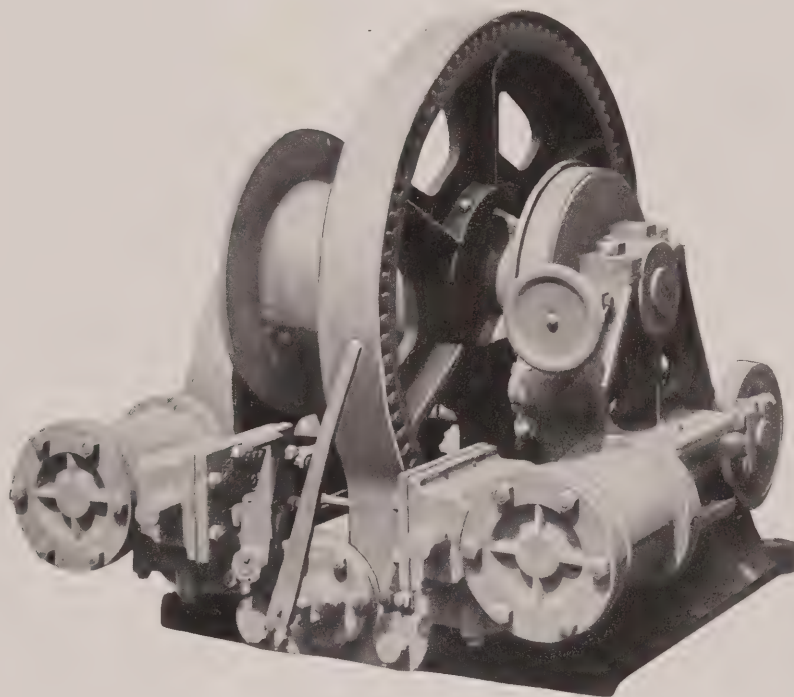
8 x 10-Inch Single-Drum Type "PPP" Deck Engine

The same as the Type "SSS," except that there are no winch heads fitted. This is a very heavy engine built for hard service in mooring 12,000 ton steamers, there being four of this type on each boat. There are also other styles of 8 x 10-inch engines which are not shown. Type "L" has two winch heads for manila line, keyed to the main drum shaft and revolving with it. Type "M," has a small drum 16 inches diameter on one side. Both drums are operated with clutches, allowing each to turn independently or together. Hand mooring gear is fitted to all types.



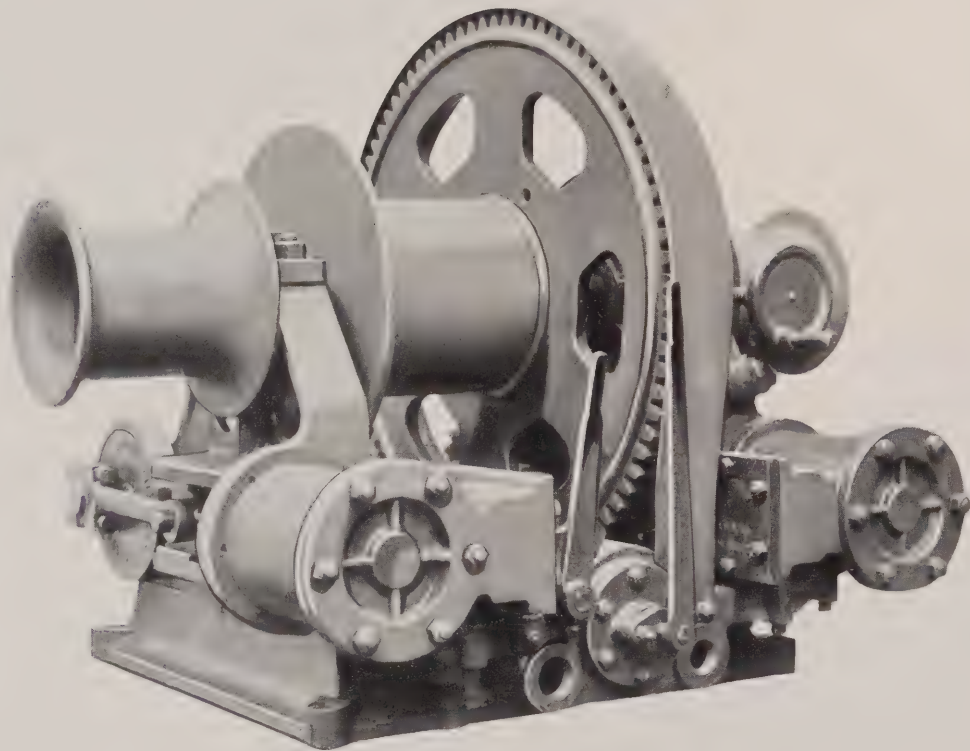
8 x 8-Inch Type "F" Deck Engine

A double-drum deck engine, each one of which is operated independently of the other. The drums are fitted with strong brakes controlled by hand wheel and screw. This type is also fitted with hand mooring gear, by which the drum may be revolved when there is no steam pressure available, as in winter.



8 x 8-Inch Single Drum Type "FB" Engine

A double-cylinder deck engine, without winch heads and fitted with a ratchet gear for hand mooring.
Controlled by a steam reversing valve, which changes the direction of the steam into the opposite end of the cylinders.



8 x 8-Inch Single-Drum Type "FF" Engine

A double-cylinder deck engine, fitted with two winch heads for manila line, keyed to the main drum shaft. This engine is not regularly supplied with the hand mooring gear, but is fitted with the standard reversing valve. This engine is sometimes used with one winch head fitted either side. Smaller size deck engines are made with double cylinders 5 x 6 inches and 6 x 6 inches, in several different types. The general construction is similar to the larger 8 x 8-inch engines, except that they are smaller. They may be fitted with or without brake and with a small drum on one side, or without.



Solid Propeller Wheel

Solid propellers are sometimes furnished for tugs and small size steamers in preference to sectional wheels. While usually made of cast iron, they may also be of semi-steel and when great strength, as well as lightness, is required, cast steel may be used, as for ice crushing tugs, etc.

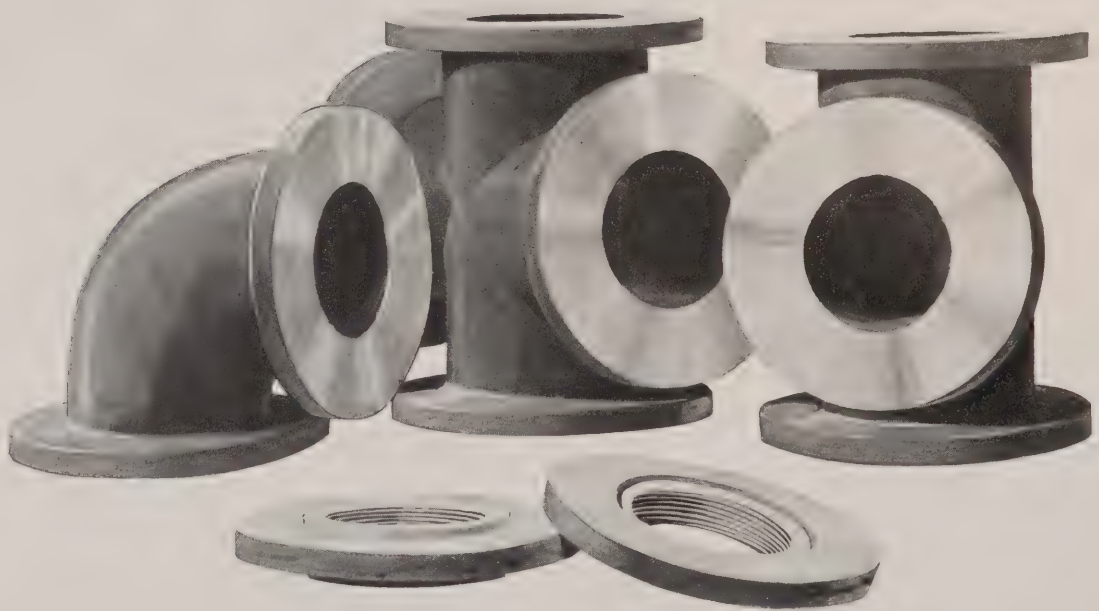
Any size or pitch of wheel can be made.



Sectional Propeller Blades

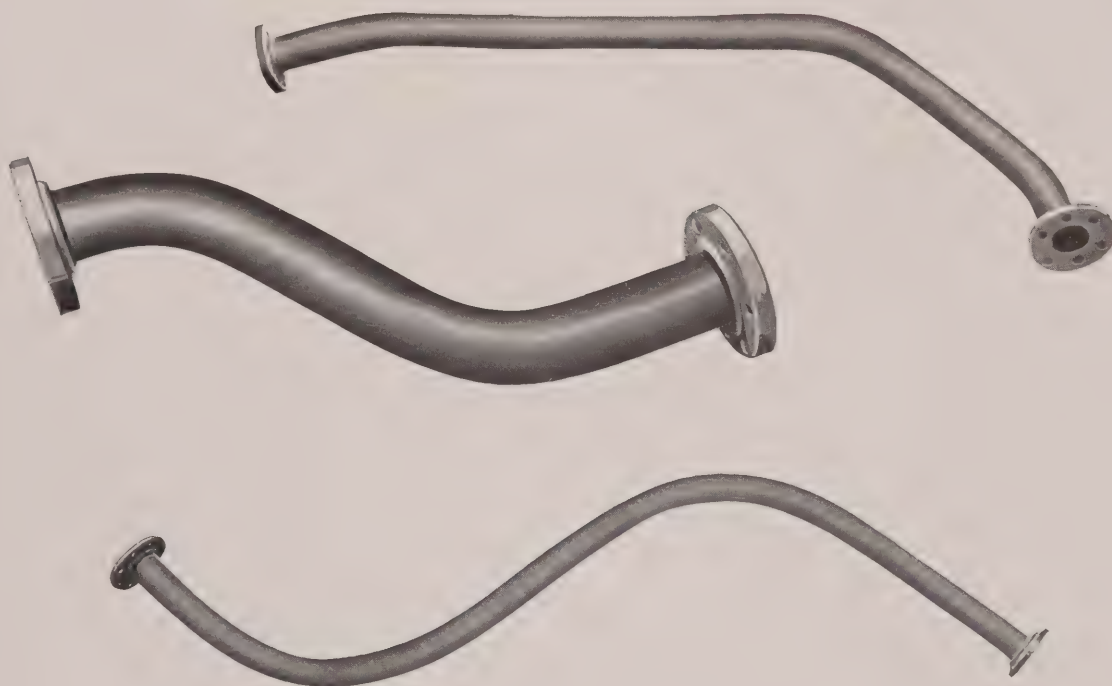
Sectional wheels are the usual type for large boats and we illustrate one blade of this kind. The great advantages of sectional wheels are so obvious that we need not enumerate them here. A stock of the standard sizes is always on hand. Blades can be furnished in cast iron, cast steel or bronze. For passenger boats, we can furnish blades with surfaces polished and with wheels balanced.

Spare hubs, nuts and studs of the standard sizes are also in stock.



Flanged Pipe Fittings

Flanged pipe fittings, in brass, semi-steel or cast iron, for extra heavy or light pressures, are a specialty.
We can make fittings for any purpose or of any special sizes or shapes.



Specimens of Extra Heavy Pipe Bends as Fitted in Our Ordinary Line of Work

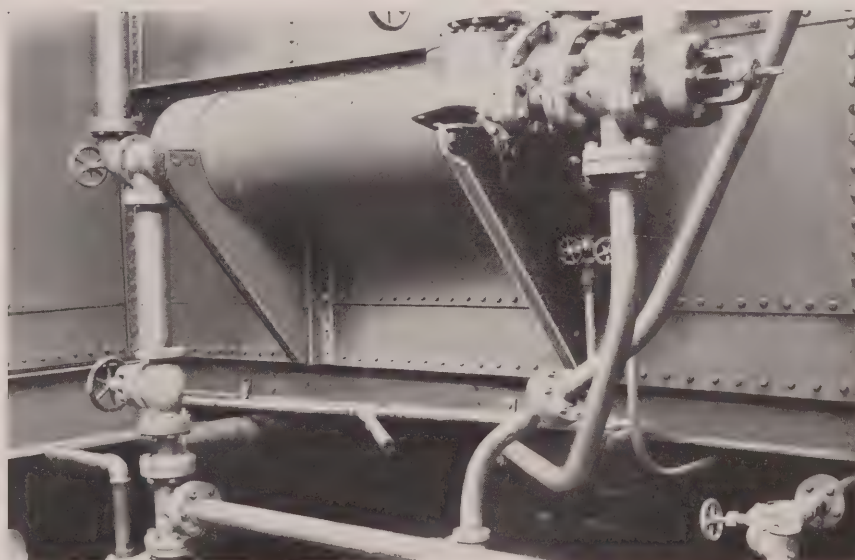


Illustration of Feed Water Heater as Piped Up in Vessel

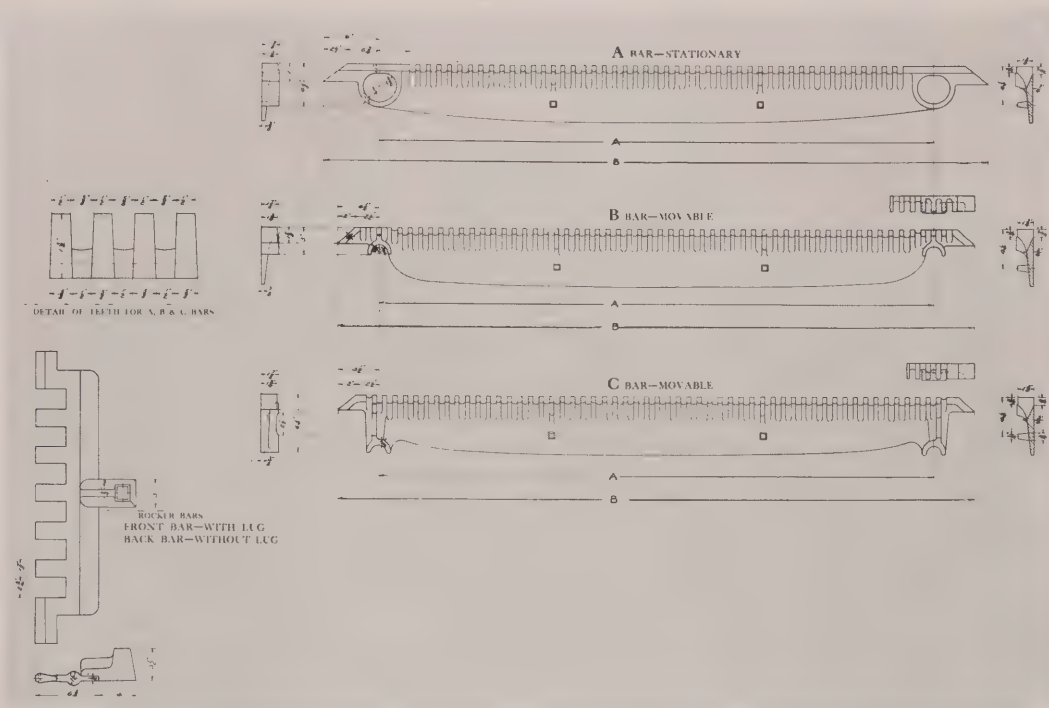
We are prepared to make up pipes in steel, iron, brass or copper in any size or length or bent to any desired form. They can be supplied with or without flanges. Pipe railings for safety guards, stairs, ticket window guards, platforms, in brass or iron, plain or fancy.

Riveted steel plate pipes of large diameter for steam, exhaust, vacuum or water, can also be made on short notice.



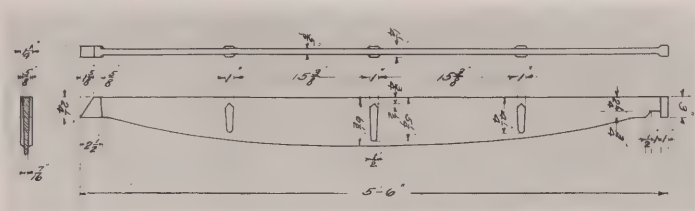
Flag Poles

Steel flag poles are fast displacing wood poles and when set in concrete bases are practically indestructible. We can make these up in any length and any diameter. They are of different sections of pipe securely riveted together and fitted with trucks, cleats and halyards. Larger and longer poles can be built of plate when so desired.

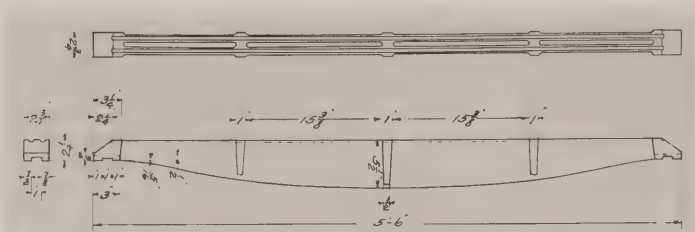


Aetna Shaking Grate Bars

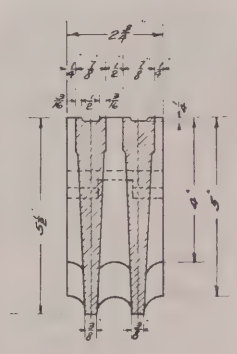
Aetna Shaking Grate Bars have been used so long that no detail description seems necessary. Many engineers prefer them to a stationary grate bar. We make them in lengths from 2 feet 4 inches up to 6 feet 6 inches over all and to fit any furnace.



Standard Single Grate Bar



Standard Double Grate Bar



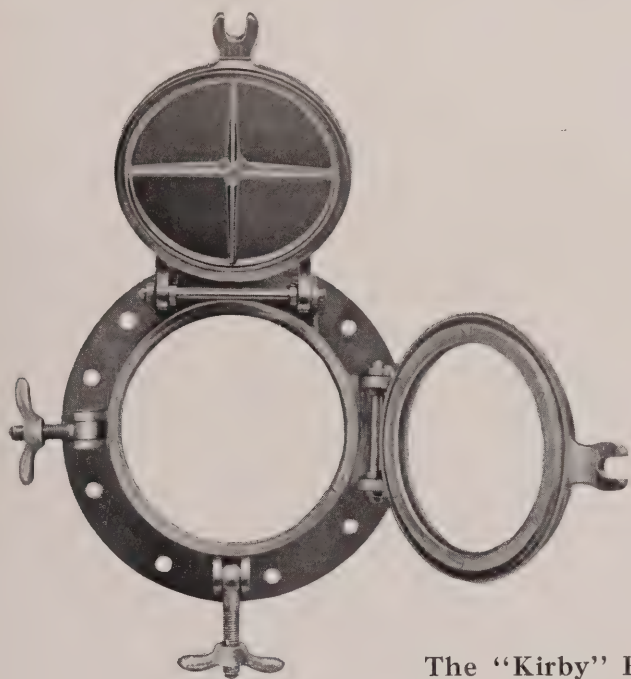
Cross Section of Double Grate Bar

Two styles of common grate bars are shown, which are more universally used than any other pattern. We make them in all sizes and lengths, also circular grates for donkey boilers.



Passage Light

This illustrates a design of our improved passage or casement light; doors hinged outboard, permitting the flow of air to be directed into the interior of ship as desired for ventilating. Center crossbar is removable, making full opening available for use as escape port in case of necessity. Opening, 22 x 37 inches in the clear.



Port Lights for Metal Ships

Size of Openings, 4 in.	Thickness of Glass, $\frac{1}{2}$ in.
Size of Openings, 6 in.	Thickness of Glass, $\frac{1}{2}$ in.
Size of Openings, 8 in.	Thickness of Glass, $\frac{3}{4}$ in.
Size of Openings, 10 in.	Thickness of Glass, $\frac{3}{4}$ in.
Size of Openings, 12 in.	Thickness of Glass, $\frac{3}{4}$ in.
Size of Openings, 14 in.	Thickness of Glass, $\frac{3}{4}$ in.
Size of Openings, 16 in.	Thickness of Glass, $\frac{3}{4}$ in.
Size of Openings, 18 in.	Thickness of Glass, $\frac{3}{4}$ in.

Brass covers may be furnished for these port lights.

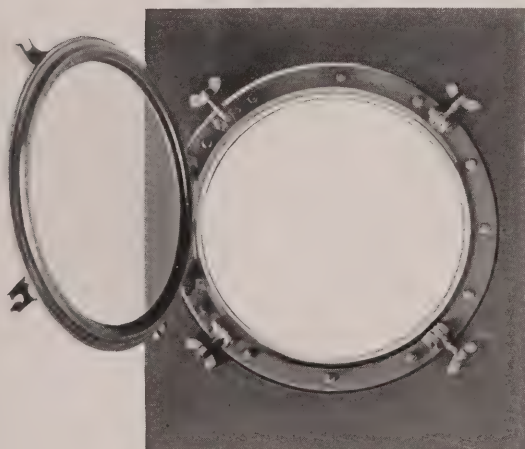
Iron Port Lights and Port Lights for wooden ships made to order.

The "Kirby" Escape Ports

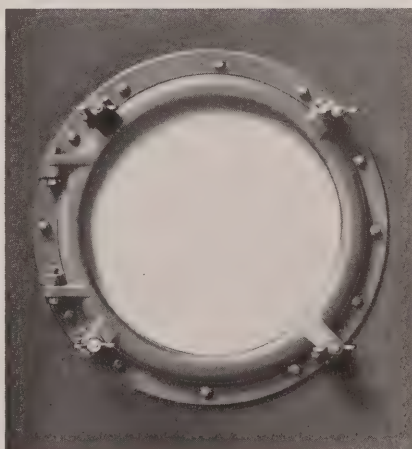
No. 351 Rough Brass, length $20\frac{3}{4}$ in., width $18\frac{3}{4}$ in., clear glass $14\frac{1}{2}$ in. x $12\frac{3}{4}$ in., 1 in. thick, size of opening 16 in. x 14 in.

No. 352 Rough Brass, length $24\frac{3}{4}$ in., width $18\frac{3}{4}$ in., clear glass $18\frac{1}{2}$ in. x $12\frac{3}{4}$ in., 1 in. thick, size of opening 20 in. x 14 in.

Made with cast brass frame and iron cover.



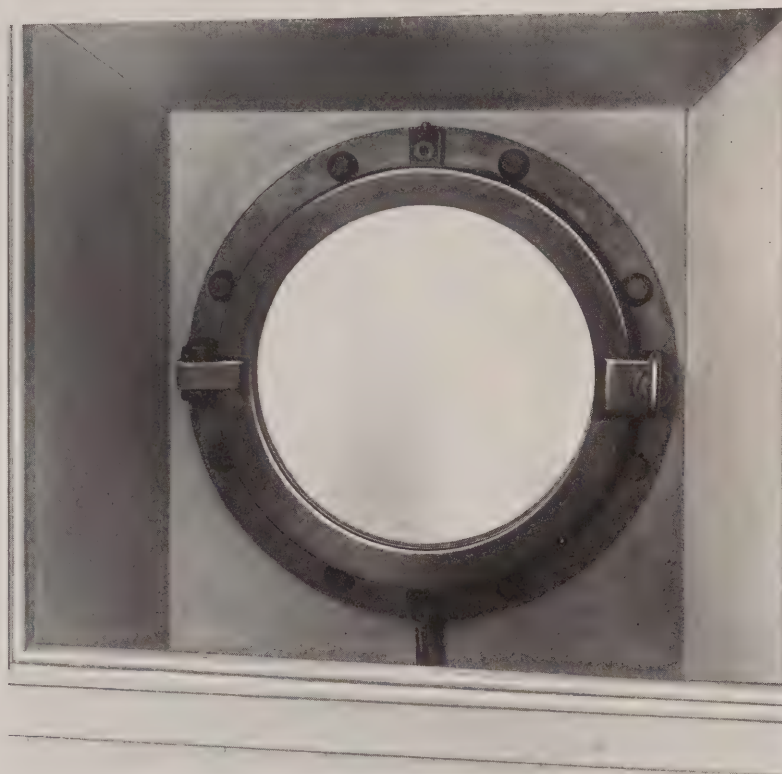
Cover Open



Cover Closed

Standard Port Lights

We manufacture a complete line of air ports of all sizes and types, in various metals such as cast iron, brass, semi-steel, malleable iron, etc. We illustrate a few of the standard patterns which are in common use. In addition to these we have patterns for deck lights, both rectangular and circular, and various sizes of "fixed" deadlights fitted in steel storm shutters. These lights are also suitable for use in steel skylights. Our circular lights range in size from 8 inches in diameter to 20 inches in diameter. We will be pleased to send sketches covering any requirement which you may have.



Pivoted Air Port

These illustrations show The American Ship Building Company's improved air port, with swiveling light so arranged that air can be regulated and directed into the interior of the ship at pleasure. Made of brass showing 12 inches of clear glass and $13\frac{3}{4}$ inches clear opening.

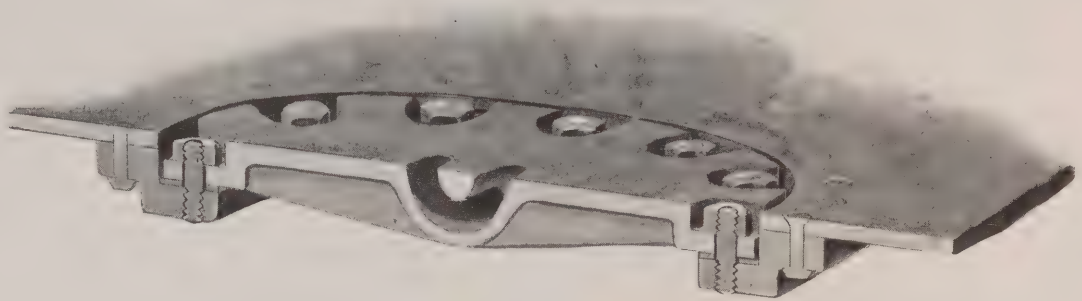


Steel Storm Shutters

This cut illustrates our design of steel storm shutters for deck house windows, made to pass the U. S. Steamboat Inspection Service.

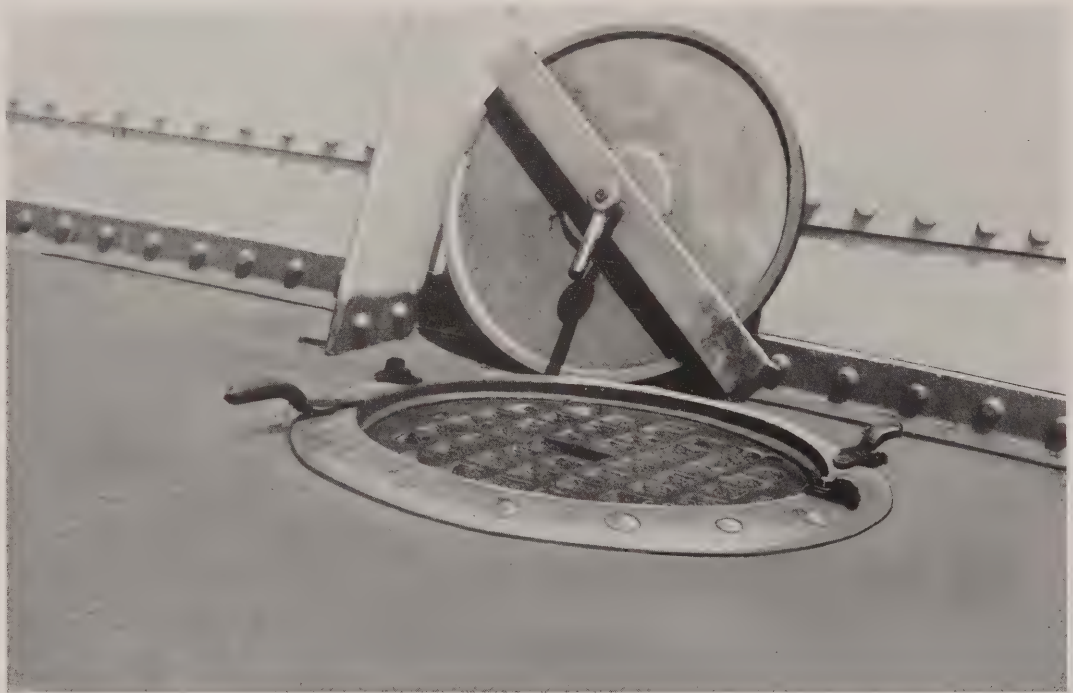
They are well built in every detail and very strong and durable. The cover itself is made of steel plate of ample thickness, flanged on all edges for strength and rigidity, and fitted with heavy hinges. It can be operated from the inside of the cabin, and has a brass swing bolt for retainer when not in use. The light is generous in size and of heavy glass and fitted with copper screen.

These shutters, fitting completely over the present window casings, can be installed without alterations to the existing joiner work. We also manufacture shutters in various low cost designs.



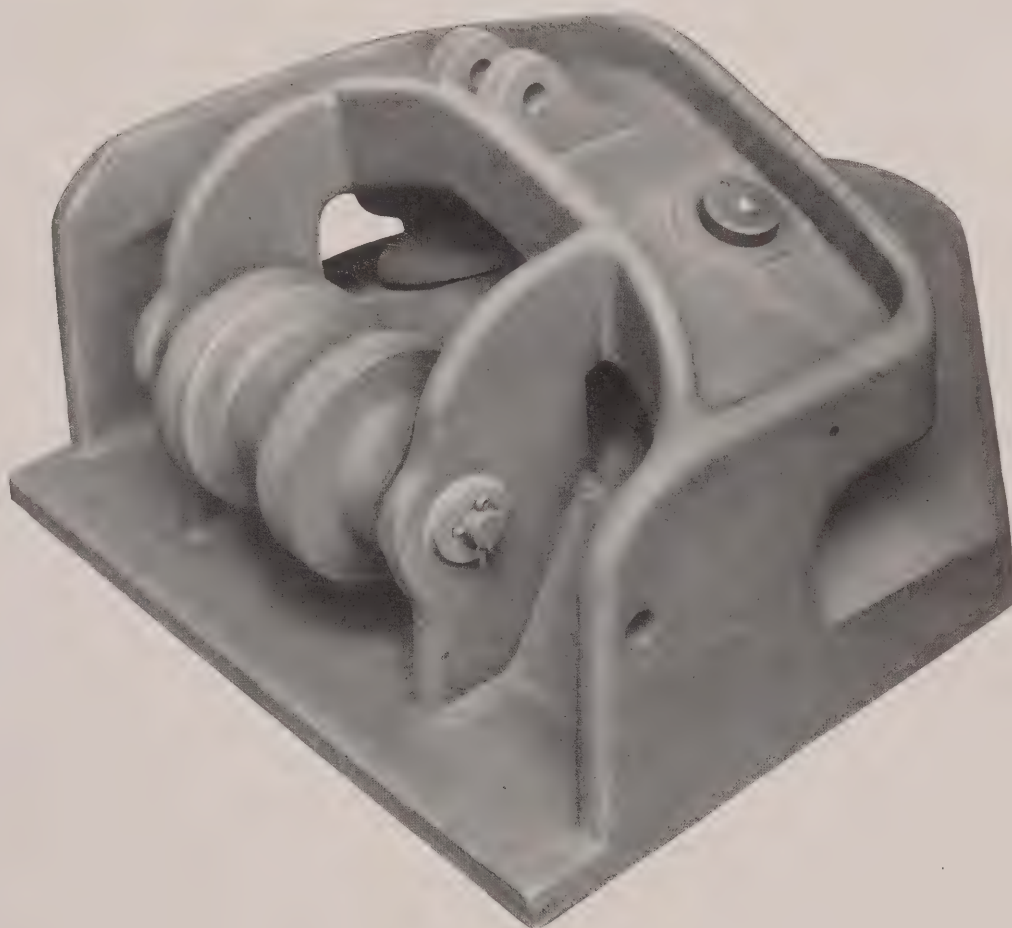
Scuttles

Scuttles vary in size from 6 inches diameter to 30 inches and are used for means of escape as well as for entrance and exit from various compartments. These scuttles can be fitted with or without gratings for passing lines and hose, oil, coal, etc.



Tank Top Manholes

The above cut shows our flush manhole, suitable for use in tank tops or hopper sides, or wherever a flush surface is desired. We have this style in sizes 12 x 17 inches and 14 x 18 inches elliptical in shape, and of cast iron or steel. Gaskets and spare covers always carried in stock.



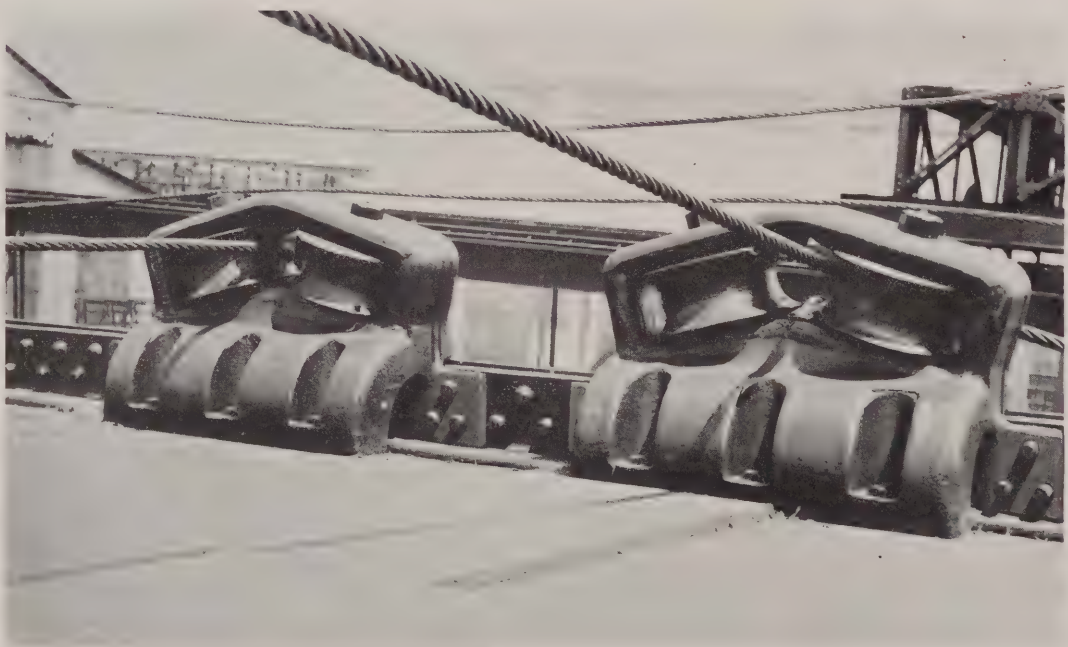
Towing Chock for Bow of Barge

Made very heavy and strong to withstand the shocks to which it is subjected when towing in a rough sea. These are made to order only and to suit each special requirement.



Manila Line Chocks

For leading manila mooring lines through steel or wood bulwarks, we make a large variety of chocks with flanges for attachment. The above is a sectional illustration of our 7 x 15-inch chock which is the most widely used pattern, and is made in cast iron. We also make these in smaller sizes, of brass, suitable for yachts and small boats, as well as much larger sizes with chafing rollers, suitable for the heaviest class of work found in marine practice.



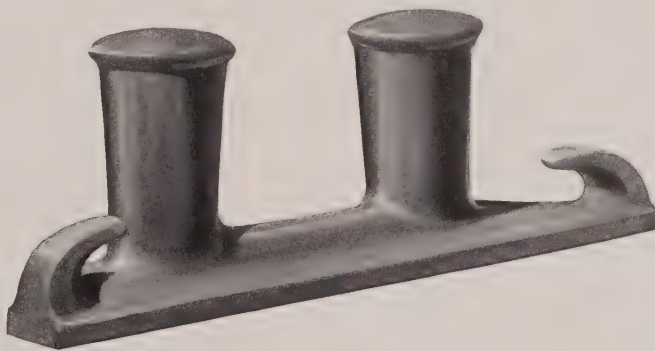
Single Mooring Chock

The above shows an installation of two single mooring chocks for wire lines fitted on gunwale bars of ship, and is most generally used on the Great Lakes. The body is cast iron and the sheaves are cast steel. Pins are tool steel of great strength and brass bushed with provisions for oiling. The sheaves are 12 inches in diameter and made in the above or the well known Mallory type.



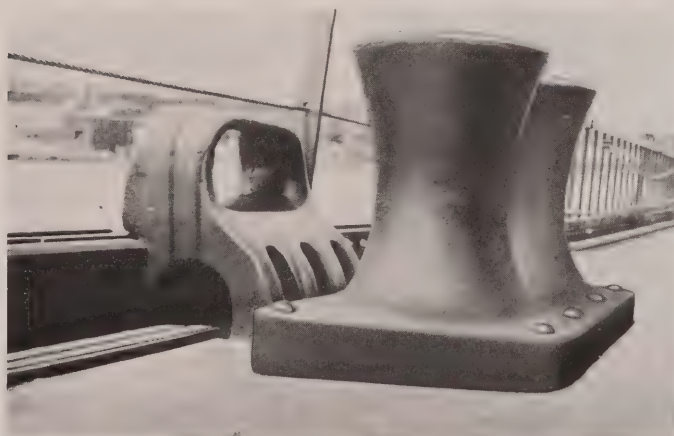
Timberheads

We illustrate a few of the many types of timberheads which we make up as desired, in cast iron or steel.



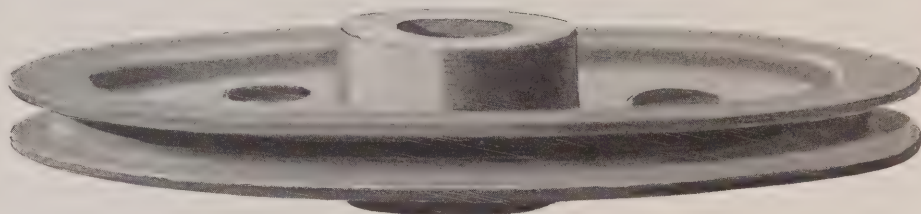
Combination Mooring Timberhead

This design shows a combined mooring chock and timberhead suitable for use on any flush deck vessel, such as drill boats, dredges, dump scows and similar vessels, and also for dock use. The base is 50 x 17½ inches and timberheads 18 inches high, strongly made of cast iron.



Manila Line Chock

The above cut shows our standard 7 x 15-inch chock for manila lines as fitted on the gunwale bar of a steamer. The timberhead shown is the standard for mooring purposes, the base of which is 20 x 43 and 23 inches high.



Chain Sheaves



Rope Sheaves

We are prepared to estimate on your requirements for special sheaves of large diameter for heavy work, such as cableways, derricks, etc., and will build to order complete rope or chain blocks of extra large sizes.

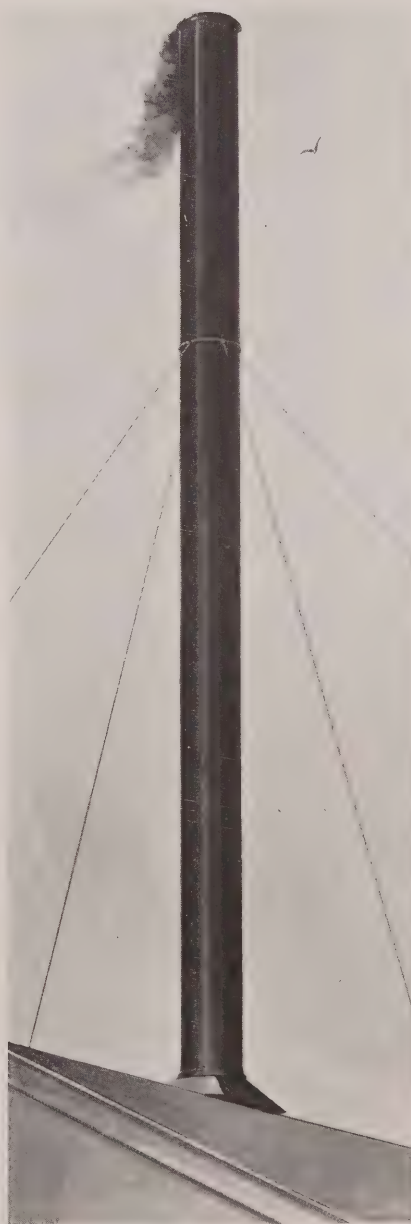


Double Smokestack

Type of double smokestack for vessels, fitted with whistle, escape pipe and a grating for access to whistle. We always fit a ladder on the forward side of the stack for reaching the top, painting, etc.

Steel Smokestacks

Steel smokestacks for both marine and stationary boilers built and erected. Breechings, smokeboxes, etc. Send plans and specifications for prices.



Stack for Stationary Boiler

Tank Work

Tank work is a feature for which our shop is well adapted. We make tanks for any special need, in any size or shape, and will submit estimates on any work of this nature which you may require.

Dished or flanged heads for boilers and tanks made to order.



Vertical Air or Water Receiver



Horizontal Air or Water Receiver



Adjustable Ventilating Cowl



"Cyclone" Ventilator Top
Made from Galvanized Steel

Adjustable Ventilating Cowls

Sizes: 8 in., 10 in., 12 in., 15 in., 18 in., 20 in., 24 in., 30 in. and 36 in.

Made from galvanized iron, painted with asphaltum.

Brass Ventilating Cowls made to order.

Other sizes to order.

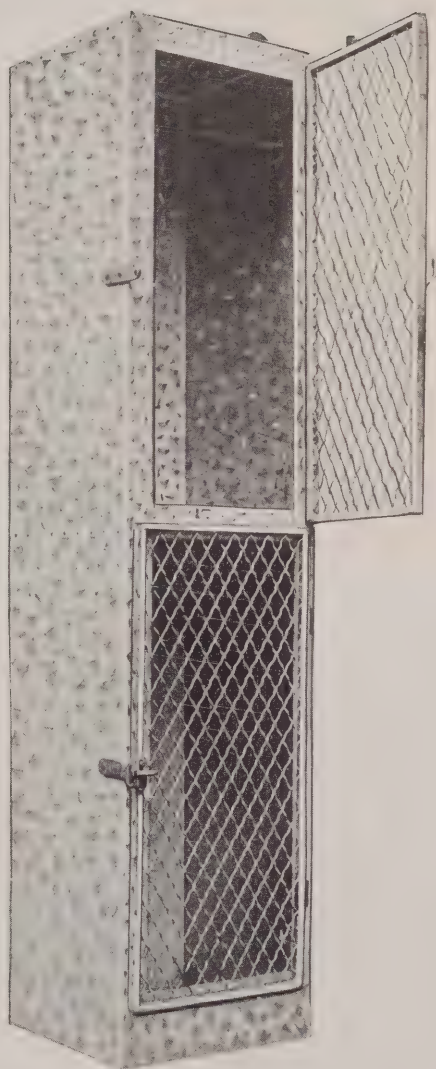
"Cyclone" Ventilator Tops

**For Improving the Draft in Smoky Chimneys and Removing
Hot Air from Poorly Ventilated Rooms**

Sizes: 3 in., 3½ in., 4 in., 4½ in., 5 in., 6 in., 7 in., 8 in., 9 in., 10 in., 11 in., 12 in., 14 in., 16 in., 18 in. and 20 in.

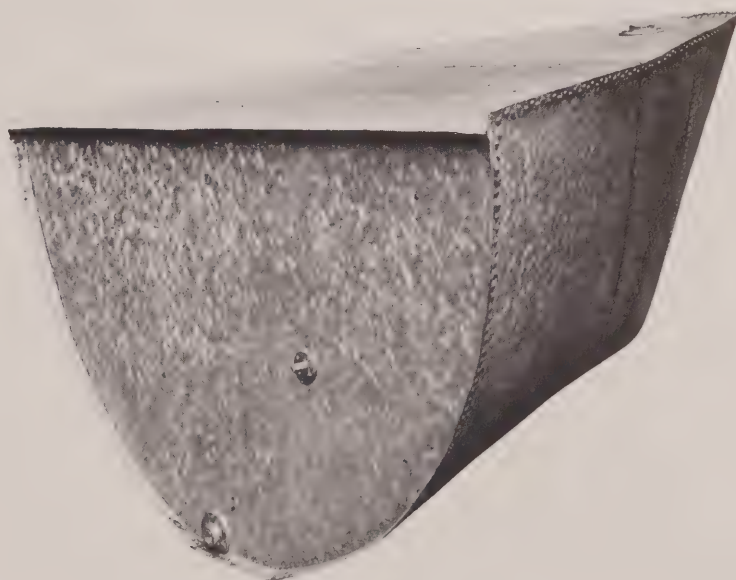
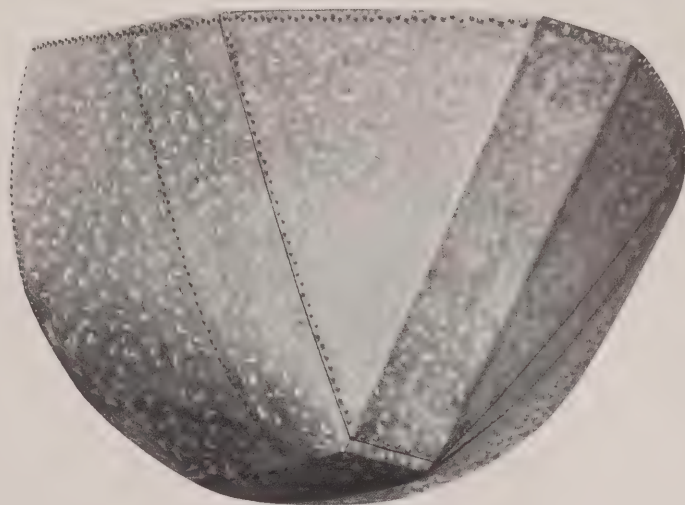
Square or odd shaped bases will be charged extra.

Other sizes to order.



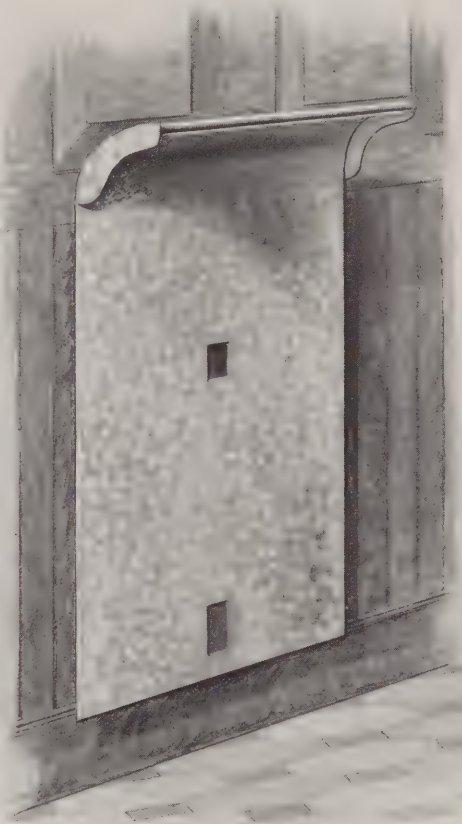
Steel Lockers

Lockers for clothing, tools, supplies, etc., made to any size.
They are very strong and light and can also be
made with solid or glass panel doors and
fitted with or without locks.



Lifeboat Tanks

Lifeboat air tanks are a specialty with us. We make them to fit the boats, in the proper size required by law. They are tested before leaving the shop.



Galvanized Radiator Shield



Brass Radiator Shield

Brass or galvanized iron Radiator Shields made to order. There are no standard shapes or sizes for these, but we will submit prices on your requirements.



Spelter Pan

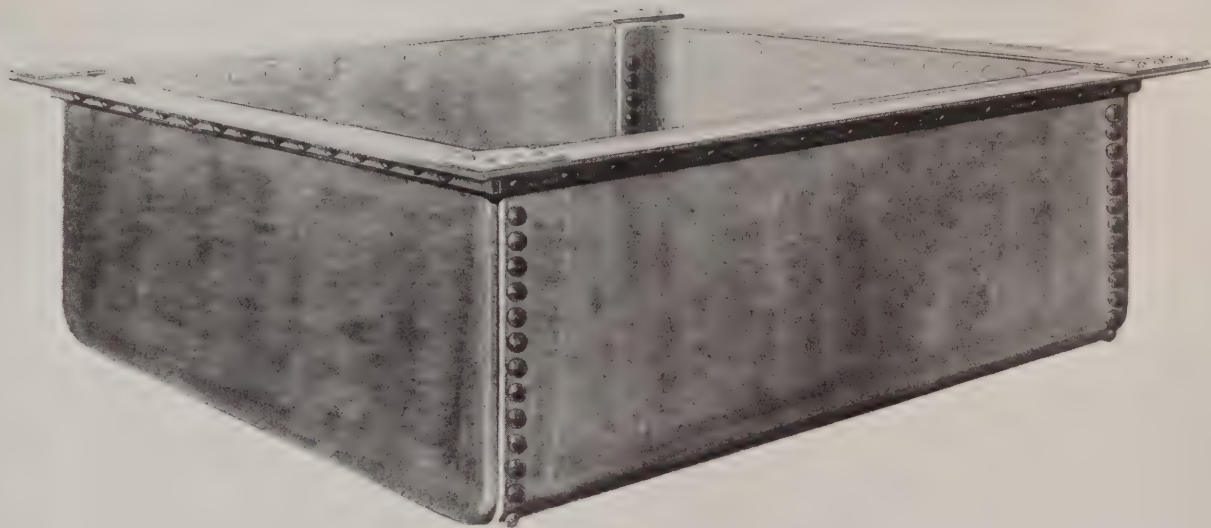
13 feet 9½ inches long; 4 feet wide; 2 feet 4 inches deep; Soft steel plate, 1 inch thick.



Lead Pans

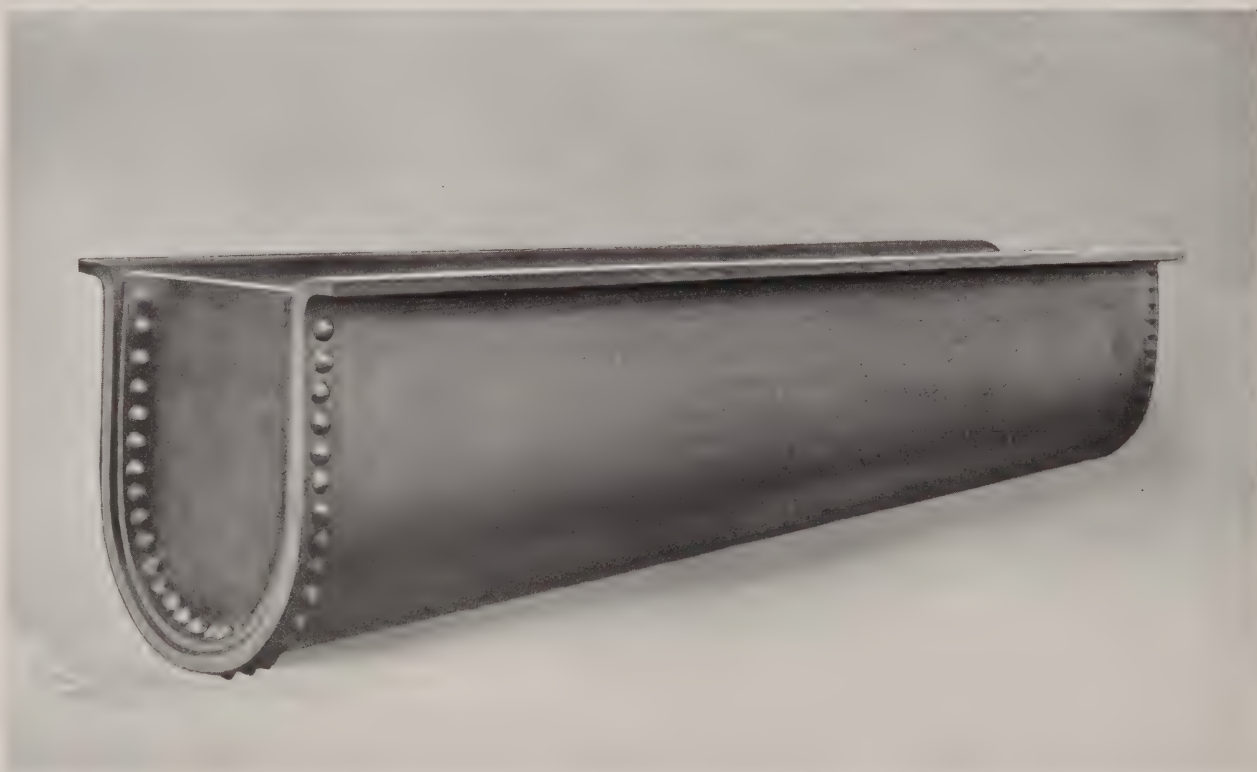
18 feet long; 39 inches wide; 10 inches deep; Plate, 1 inch thick.

Another boiler shop specialty is that of galvanizing pans, lead pans, kettles, digesters and other forms of very heavy plate work. We illustrate several types of pans recently made.



Square Galvanized Pan

7 feet 6 inches by 7 feet 4 inches by 3 feet 8 inches deep; Flange steel plate, $1\frac{1}{4}$ inches thick.



Galvanizing Pan

13 feet long; 26 inches wide; 30 inches deep; Made of $1\frac{1}{2}$ inch thick soft flange steel.

Marine Hardware

OUR line of Marine Hardware is a result of the demand for special work required for fitting out vessels. We are prepared to submit estimates on hardware of the different styles shown from your blue prints or specifications. A reasonable stock is carried and orders can be filled with dispatch.

Other goods in this line can be supplied to suit special designs and requirements and we solicit your inquiries and hope to receive a trial order, small or large.



Complete "Kirby" Locks

In the following pages are described the different styles of "Kirby" Locks, as manufactured by this Company.

Each lock is packed *complete* in a pasteboard box. Knobs, key, escutcheon, and all necessary bronze screws (in a sealed envelope) are included. The box is carefully packed and labeled, and customers should remember that we include in our price, a *complete lock*.

These locks are of cast bronze with phosphor bronze springs, hand fitted, highest grade of workmanship, practical design and fine finish.

The box keeper is furnished with Inboard locks, to give the lock a symmetrical appearance when the door is closed. A flat keeper will be supplied if desired and must be especially noted in ordering. The flat keeper is furnished with Outboard locks; it acts as a protection to the door frame when the knuckle of the lock passes it.

One key is included in the price of each lock. If more than one key for each lock is desired, the required number should be *ordered* before the lock leaves our factory, as this insures that the extra keys are properly fitted.

Keys are not interchangeable, fitting only the lock for which they are made; if so ordered, we will furnish one style of key to fit any number of locks.

Pass or Master keys can be furnished to open any lock, and are intended for use only of those in charge of the rooms.

Following are the different styles of locks:

"KIRBY" CABIN LOCK

"KIRBY" HALL LOCK

"KIRBY" PARLOR LOCK

"KIRBY" STATE ROOM LOCK

"KIRBY" LIGHT DOOR LOCK

"KIRBY" EXTRA HEAVY LOCK

"KIRBY" TOILET ROOM LOCK

"KIRBY" MORTISE LOCK

"KIRBY" SLIDING DOOR LOCK

"KIRBY" SCREEN DOOR LOCKS

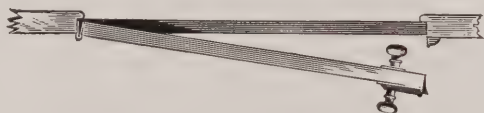
"KIRBY" PADLOCKS

Shown on the following pages are illustrations and details of each of the different styles, which are approximately half size. All knobs are interchangeable and will be furnished as ordered.

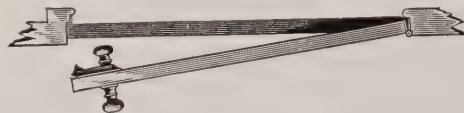
Suggestions for Ordering Locks

Assume position facing center of door, so that in opening, the door will come toward you. If the lock is to be on your right-hand side, it is a right-hand lock; if it is to be on your left-hand side, it is a left-hand lock.

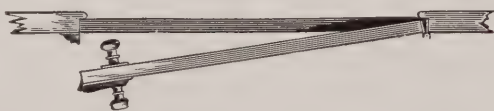
Facing the lock side of the door: if in opening, the door swings from you, an outboard lock is required; if toward you, an inboard lock is required.



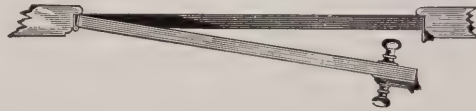
**Right-Hand Inboard Lock
Right-Hand Butts**



**Left-Hand Outboard Lock
Left-Hand Butts**



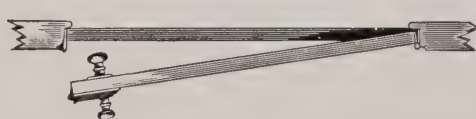
**Left-Hand Inboard Lock
Left-Hand Butts**



**Right-Hand Inboard Lock
with Special Keeper**



**Right-Hand Outboard Lock
Right-Hand Butts**



**Left-Hand Inboard Lock
with Special Keeper**

Right-hand locks (either Inboard or Outboard) always take right-hand butts.

Left-hand locks (either Inboard or Outboard) always take left-hand butts.

Inboard locks are always on the same side of door as the pin of the butt.

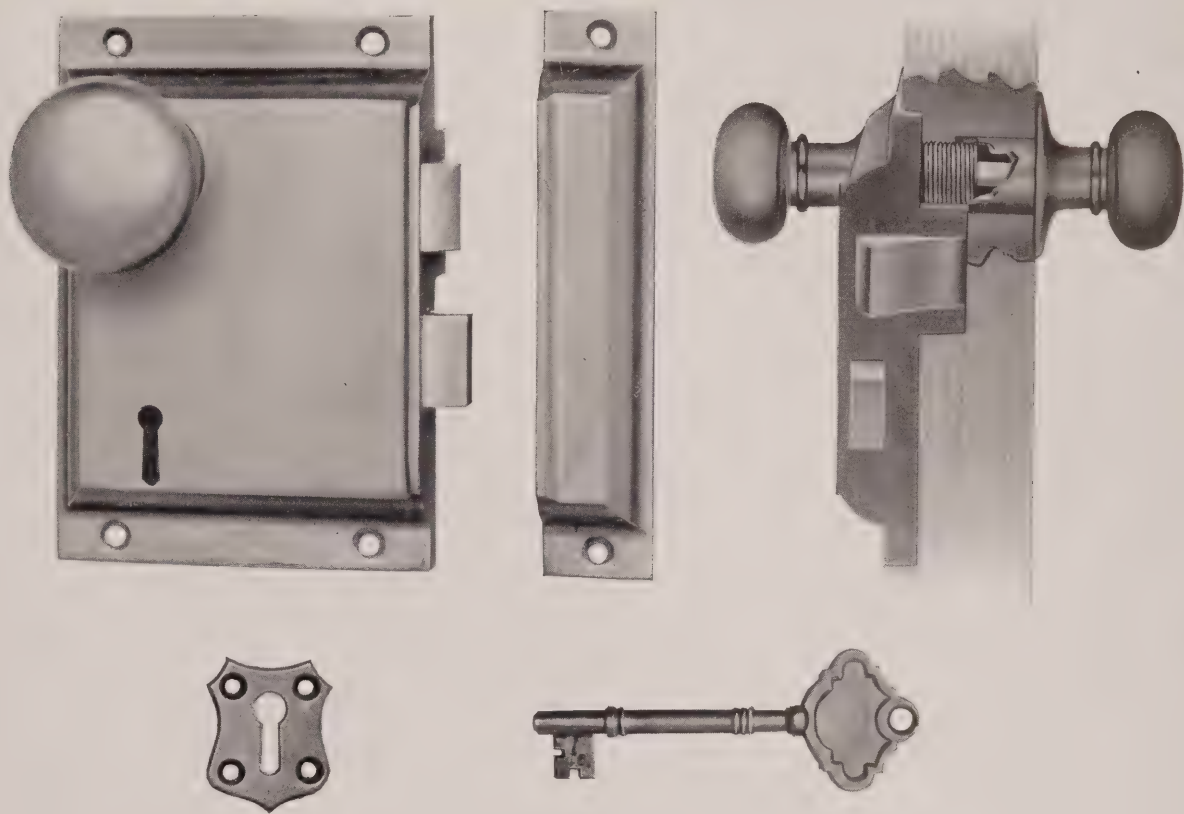
In ordering, always state thickness of doors.

Staggered Key Hole Locks and Their Use

By this arrangement (the key holes not being opposite one another) the door can be opened from the lock side at all times, but cannot be unlocked from the opposite side if previously locked from the lock side.

This type lock is desirable for use on hall and cabin doors opening on outside decks, as they can be locked from the inside, making it impossible to open them from the outside.

Cabin, Parlor and Extra Heavy Locks are furnished in this way only on special order.



The “Kirby” Cabin Lock

Approximately One-Half Size

Finish: High Bronze

	DESCRIPTION	Width (without keeper)	Length
No. 62	Right-Hand Inboard, box keeper.....	4 in.	5¾ in.
63	Left-Hand Inboard, box keeper.....	4 in.	5¾ in.
64	Right-Hand Outboard, flat keeper	4 in.	5¾ in.
65	Left-Hand Outboard, flat keeper	4 in.	5¾ in.
66	Right-Hand Inboard, staggered key hole, box keeper	4 in.	5¾ in.
67	Left-Hand Inboard, staggered key hole, box keeper... ..	4 in.	5¾ in.
68	Right-Hand Outboard, staggered key hole, flat keeper... ..	4 in.	5¾ in.
69	Left-Hand Outboard, staggered key hole, flat keeper.....	4 in.	5¾ in.

Features

The loose knob screws through the door on to the body of the lock, binding the two together. The lock has a knuckle latch, which prevents rattling and also any injury to the lock by slamming the door.

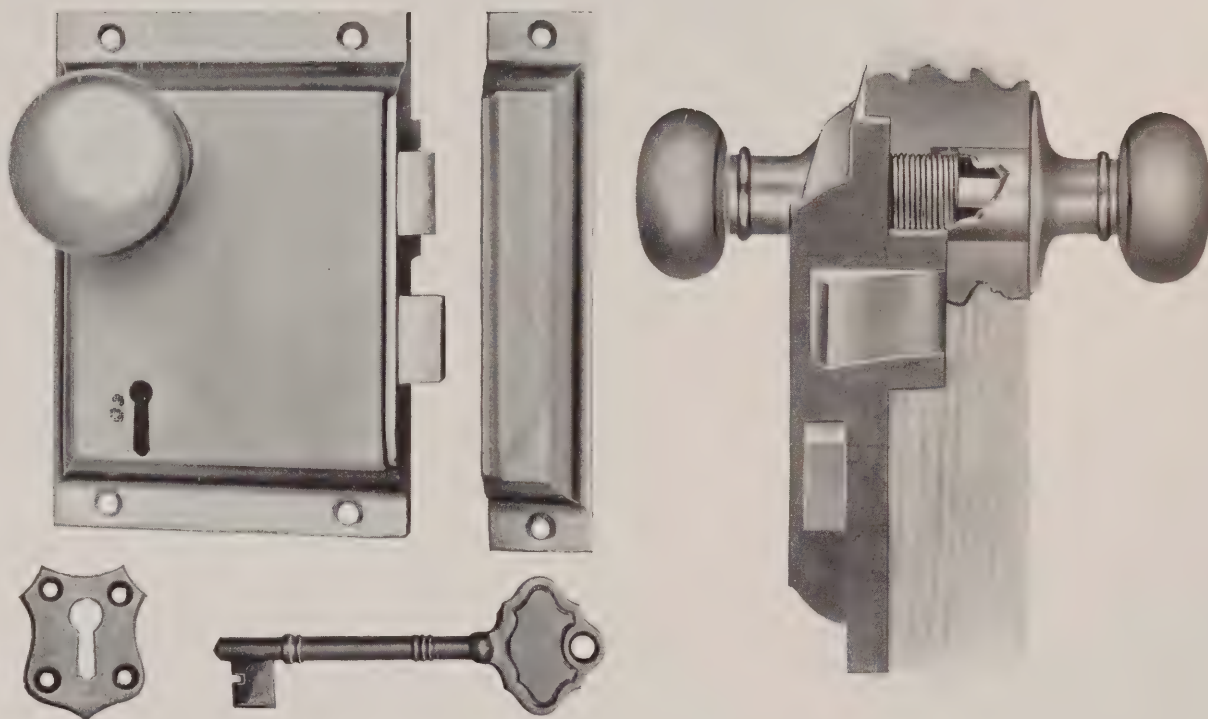
This lock is designed to meet the requirements of hard service.

If a narrower lock is desired, see the “Kirby” Hall Lock, page 120.

Plain round knobs furnished, unless otherwise ordered.

For detailed description of keepers, see page 118; staggered key holes, see page 118; special knobs, see page 130; special escutcheons, see page 131; extra keys, see page 118.

Special finishes to order.



The "Kirby" Hall Lock

Approximately One-Half Size

Finish: High Bronze

DESCRIPTION		Width (without keeper)	Length
No. 92	Right-Hand Inboard, box keeper.....	3½ in.	5¾ in.
93	Left-Hand Inboard, box keeper.....	3½ in.	5¾ in.
94	Right-Hand Outboard, flat keeper.....	3½ in.	5¾ in.
95	Left-Hand Outboard, flat keeper.....	3½ in.	5¾ in.
96	Right-Hand Inboard, staggered key hole, box keeper.....	3½ in.	5¾ in.
97	Left-Hand Inboard, staggered key hole, box keeper.....	3½ in.	5¾ in.
98	Right-Hand Outboard, staggered key hole, flat keeper.....	3½ in.	5¾ in.
99	Left-Hand Outboard, staggered key hole, flat keeper.....	3½ in.	5¾ in.

Features

The loose knob screws through the door on to the body of the lock, binding the two together. The lock has a knuckle latch which prevents rattling, and also any injury to the lock by slamming the door.

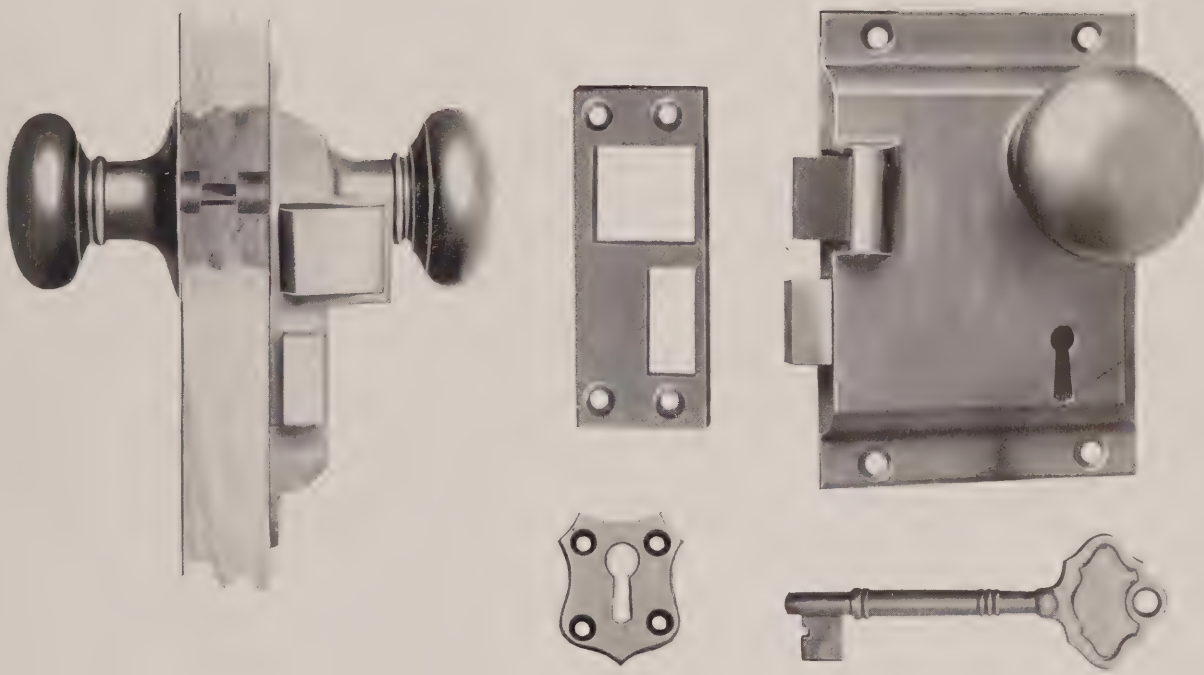
This lock is designed to meet the requirements of hard service.

It is, in all respects, similar to the "Kirby" Cabin Lock (illustrated and described on page 119), except that it is narrower.

Plain round knobs furnished, unless otherwise ordered.

For detail description of keepers, see page 118; staggered key holes, see page 118; special knobs, see page 130; special escutcheons, see page 131; extra keys, see page 118.

Special finishes to order.



The "Kirby" Parlor Lock

Approximately One-Half Size

Finish: High Bronze

	DESCRIPTION	Width (without keeper)	Length
No. 72	Right-Hand Inboard, box keeper.....	3½ in.	5 in.
73	Left-Hand Inboard, box keeper.....	3½ in.	5 in.
74	Right-Hand Outboard, flat keeper.....	3½ in.	5 in.
75	Left-Hand Outboard, flat keeper.....	3½ in.	5 in.
76	Right-Hand Inboard, staggered key hole, box keeper.....	3½ in.	5 in.
77	Left-Hand Inboard, staggered key hole, box keeper.....	3½ in.	5 in.
78	Right-Hand Outboard, staggered key hole, flat keeper.....	3½ in.	5 in.
79	Left-Hand Outboard, staggered key hole, flat keeper.....	3½ in.	5 in.

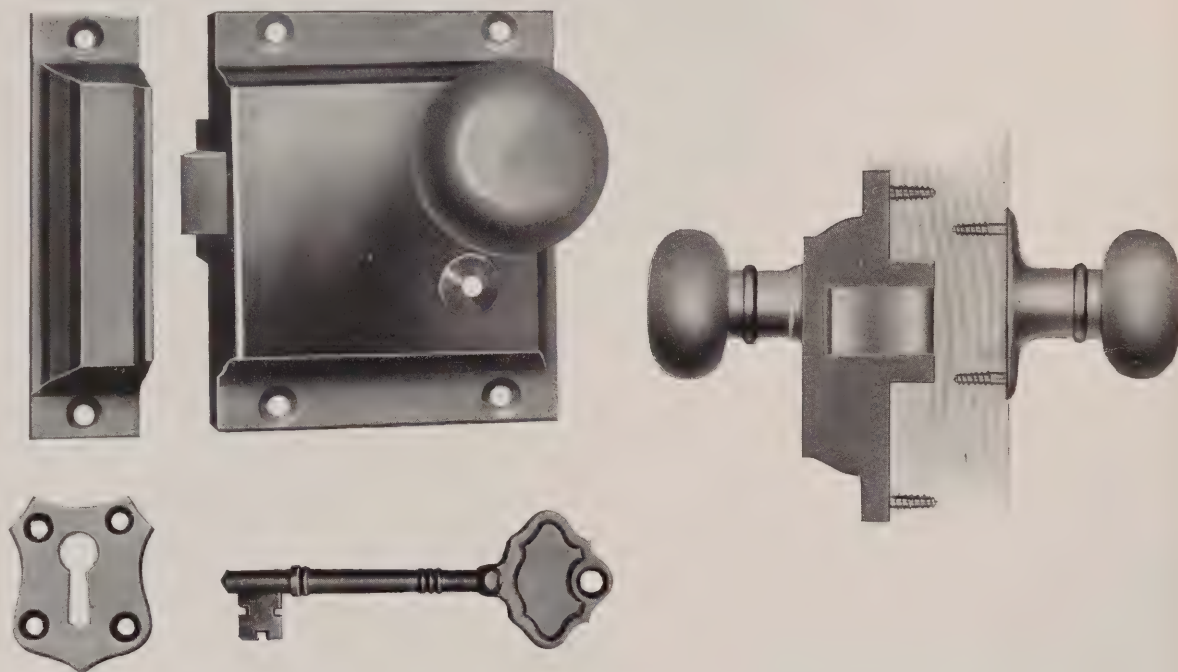
Features

The loose knob is attached to the door with screws, and is connected to the lock by a spindle. The lock has a knuckle latch, which prevents rattling and also any injury to the lock by slamming the door.

Plain knobs furnished, unless otherwise ordered.

For detailed description of keepers, see page 118; staggered key holes, see page 118; special knobs, see page 130; special escutcheons, see page 131; extra keys, see page 118.

Special finishes to order.



The "Kirby" State Room Lock

Approximately One-Half Size

Finish: High Bronze

	DESCRIPTION	Width (without keeper)	Length
No. 82	Right-Hand Inboard, box keeper	3¾ in.	4½ in.
83	Left-Hand Inboard, box keeper	3¾ in.	4½ in.
84	Right-Hand Outboard, flat keeper	3¾ in.	4½ in.
85	Left-Hand Outboard, flat keeper	3¾ in.	4½ in.
86	Right-Hand Inboard, box keeper	3⅝ in.	3⅞ in.
87	Left-Hand Inboard, box keeper	3⅝ in.	3⅞ in.

Features

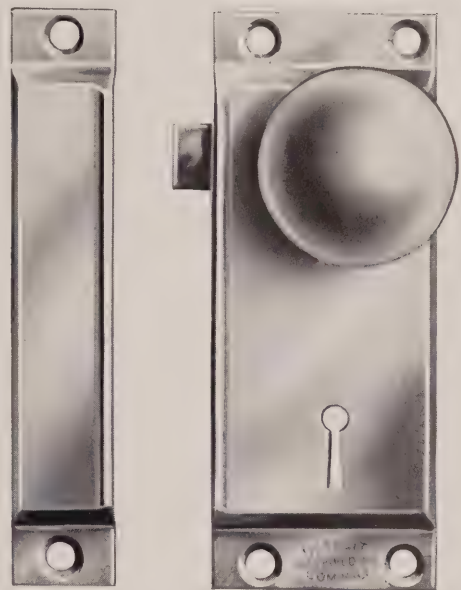
The knuckle latch is operated from the inside by the knob and from the outside by the key only. The outside knob is fastened to the door by screws, and is entirely independent of the lock, being used only as a handle for the door.

Not having a bolt and the outside knob being stationary, the door is always locked when closed, and can only be opened from the outside by using the key. From the inside, the latch is operated at all times by the knob only.

When two persons occupy the same stateroom, this type of lock is desirable, as neither can lock the other out, and anyone with a proper key has access to the room. Plain round knobs always furnished, unless otherwise ordered.

For detail description of keepers, see page 118; special knobs, see page 130; special escutcheons, see page 131; extra keys, see page 118.

Special finishes to order.



The “Kirby” Light Door Lock

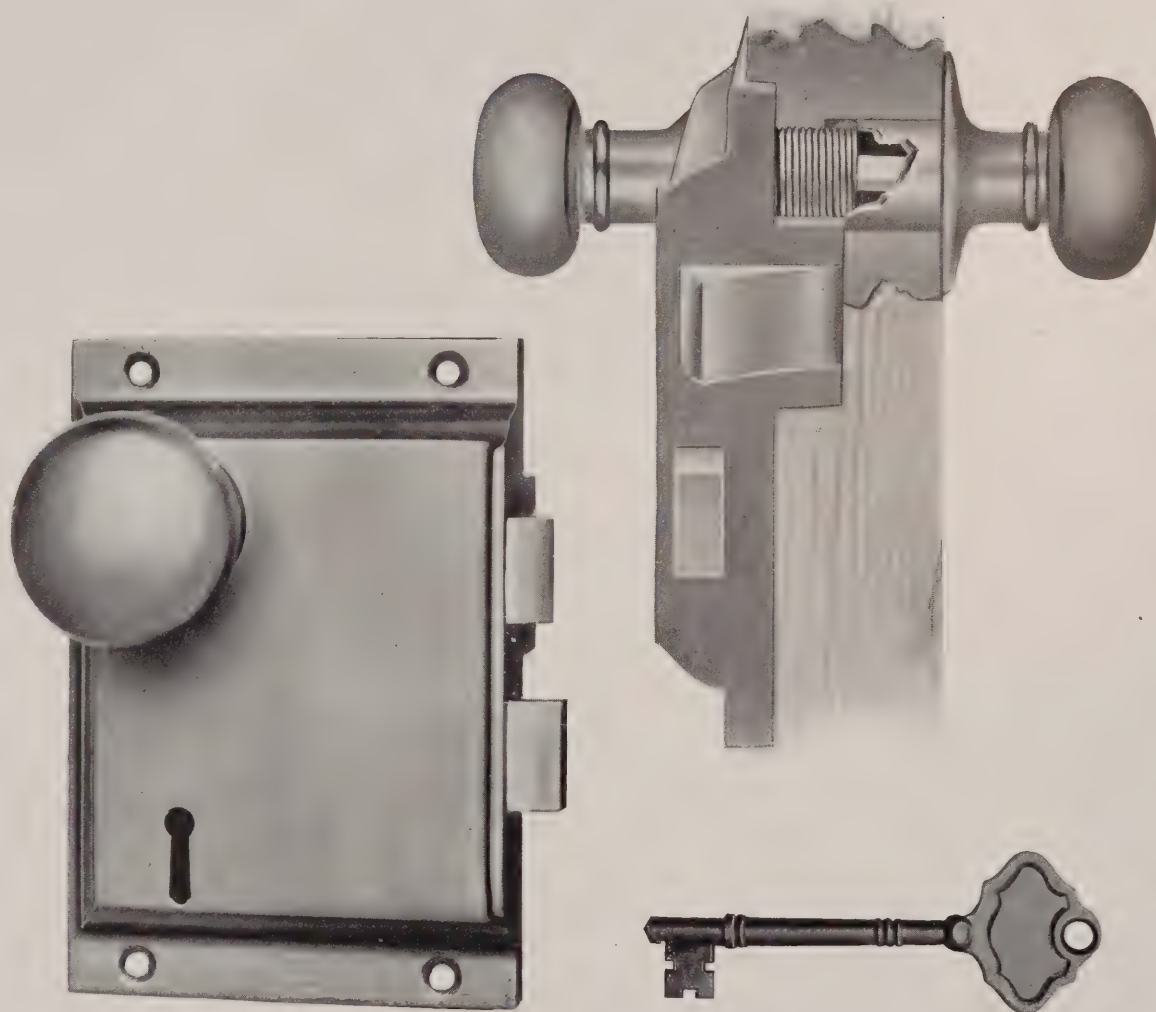
Narrow Pattern

Finish: High Bronze

	DESCRIPTION	Width (without keeper)	Length
No. 875	Right-Hand Inboard, box keeper-----	1¾ in.	4½ in.
876	Left-Hand Inboard, box keeper-----	1¾ in.	4½ in.

Features

The latch is controlled by spindle, to which knobs are attached.
A neat and serviceable small lock. Round knurled knobs furnished unless otherwise ordered.
Special knobs and finishes to order.



The "Kirby" Extra Heavy Lock

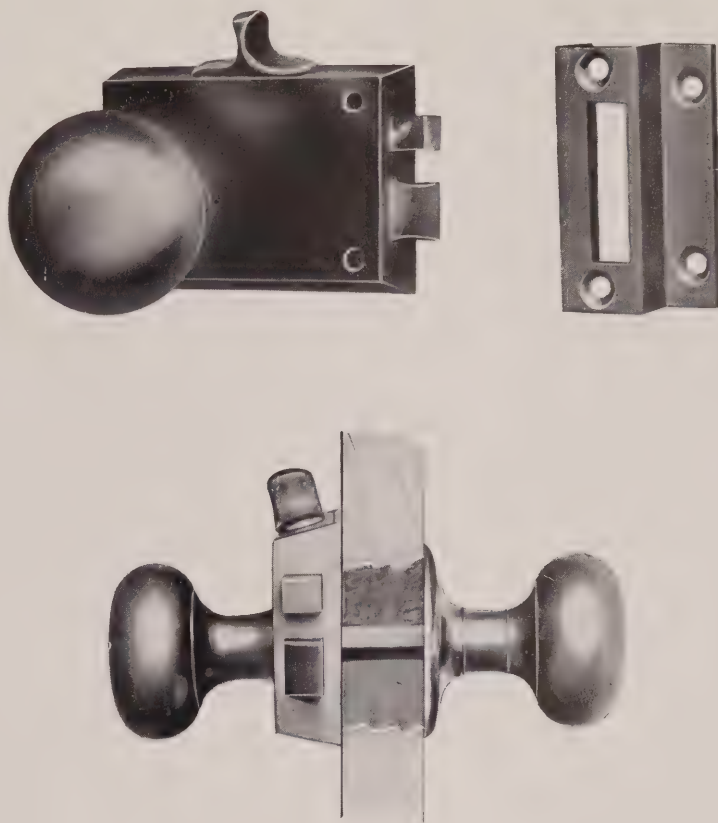
Approximately One-Half Size

Finish: High Bronze

DESCRIPTION		Width (without keeper)	Length
No. 52	Right-Hand Inboard.....	4 in.	6 $\frac{7}{8}$ in.
53	Left-Hand Inboard.....	4 in.	6 $\frac{7}{8}$ in.
54	Right-Hand Outboard.....	4 in.	6 $\frac{7}{8}$ in.
55	Left-Hand Outboard.....	4 in.	6 $\frac{7}{8}$ in.

Features

This lock is designed especially for heavy doors on Battleships, Cruisers, Passenger and Cargo vessels.



The "Kirby" Toilet Room Lock

Approximately One-Half Size

Finish: High Bronze

DESCRIPTION		Width (without keeper)	Length
No. 42	Right-Hand Inboard.....	2¼ in.	3¼ in.
43	Left-Hand Inboard.....	2¼ in.	3¼ in.
44	Right-Hand Outboard.....	2¼ in.	3¼ in.
45	Left-Hand Outboard.....	2¼ in.	3¼ in.

Features

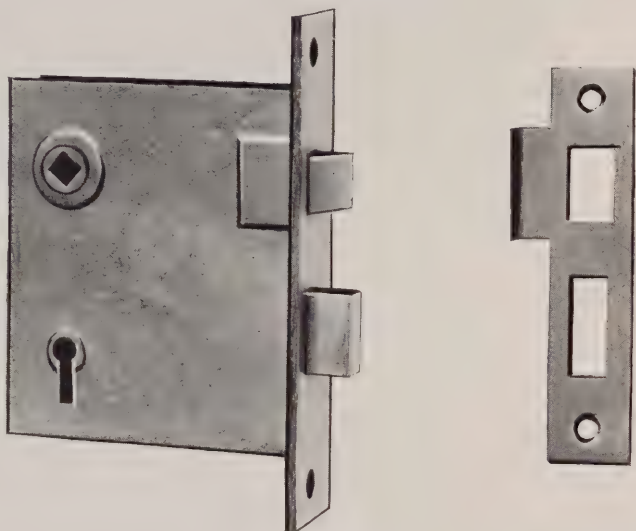
Mortise keepers are usually furnished, but special keepers will be furnished without extra cost.

The latch is reversible, and is operated from either side by the handles. The sliding bolt is operated by the handle on the top of the lock.

Plain round knobs are always furnished, unless otherwise ordered.

This lock is suitable for wash rooms, bathrooms, closets, etc.

Special finishes to order.



The "Kirby" Mortise Lock

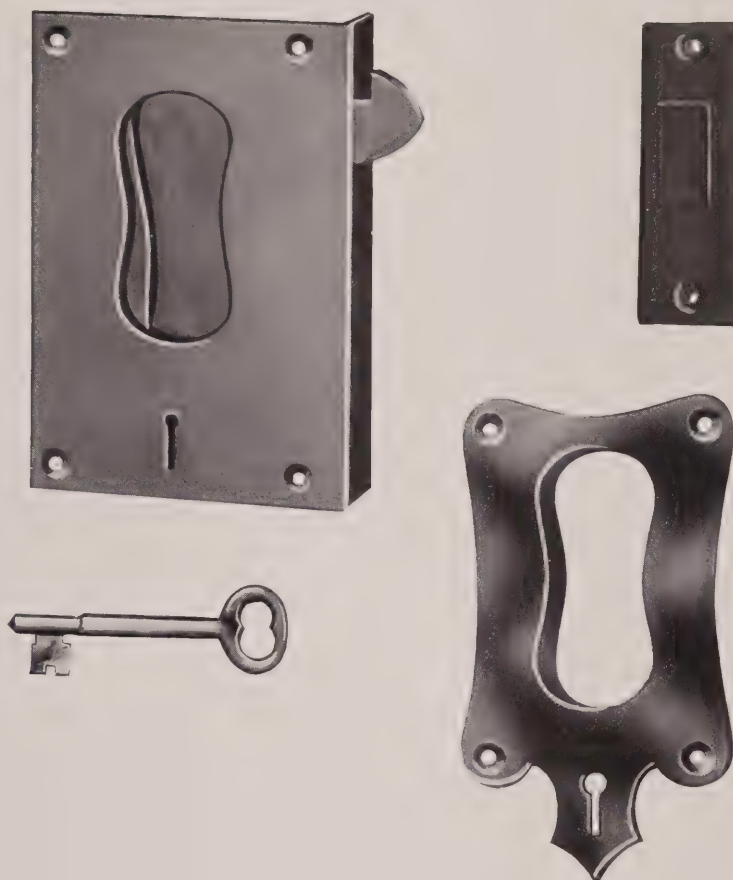
Approximately One-Half Size

Finish: High Bronze

DESCRIPTION		Size of Case (without keeper)	Size of Face Plate
No. 30	Right or Left-Hand.....	3½ x 4¾ x ⅝ in.	5½ x 1 in.

Features

The lock is made of bronze throughout and by removing the cap and reversing the latch is suitable for either right or left door. It is operated by the knob and key from both sides.
Having phosphor bronze springs, it is especially adapted for the marine trade.



The "Kirby" Sliding Door Lock

Approximately One-Half Size

Finish: High Bronze

	DESCRIPTION	Width	Length	Thickness of Case
No. 22	Right.....	3½ in.	5¼ in.	⅝ in.
23	Left.....	3½ in.	5¼ in.	⅝ in.

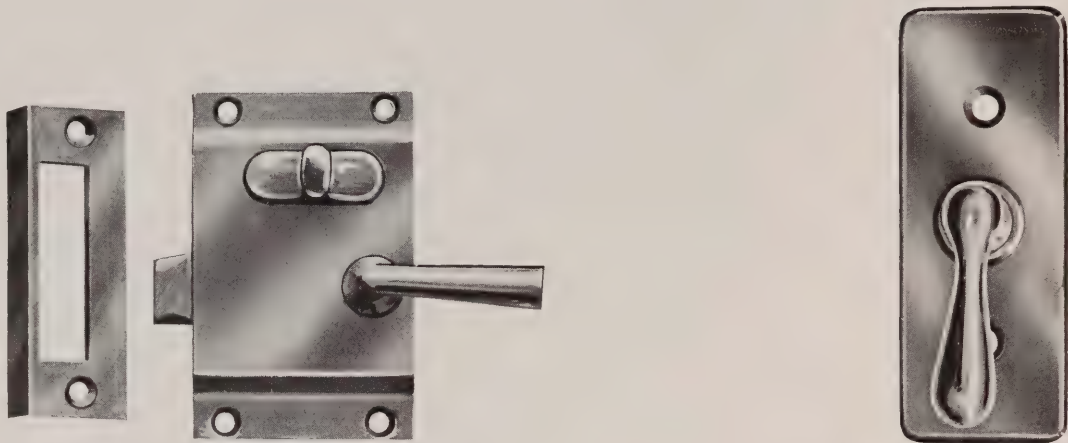
Features

Although these locks may be used on any sliding door, it is desirable for appearance, that the Right be used on a door sliding to the right, and a Left on a door sliding to the left.

This lock is to be fitted into the door frame, leaving the edges flush.

It is operated from either side by a lever handle, and may be locked with key, from either side.

Phosphor bronze springs throughout.



The "Kirby" Screen Door Lock

Finish: High Bronze

	DESCRIPTION	Size
No. 116	Right-Hand Inboard	3 in. x 2 in.
117	Left-Hand Inboard.....	3 in. x 2 in.
118	Right-Hand Outboard.....	3 in. x 2 in.
119	Left-Hand Outboard.....	3 in. x 2 in.

Furnished complete, as illustrated, with screws.

Flat keepers are usually furnished but a box keeper may be furnished without extra cost. The latch is operated from either side with handle, and has a slide bolt which is operated by the handle on face of lock. As a lock for screen doors, they are unsurpassed.

Special finishes to order.



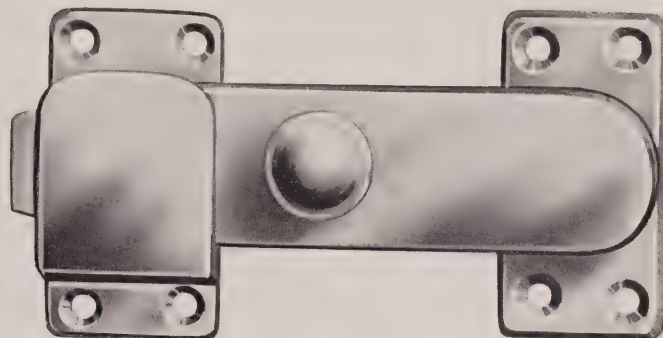
Padlocks

Emery Finish

No. 10 Lock, 2½ in. wide with key and 9-in. chain.

An extra heavy padlock made of bronze metal, emery finished, phosphor bronze springs. Attached to each lock is nine (9) inches of coil chain. Bronze key.

Names or figures can be stamped on latch or key, if so ordered, without extra cost.

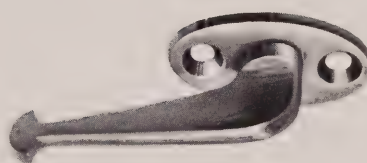


The "Kirby" Cast Bronze Closet Door Latch

No. 370 Cast Bronze

No. 371 Nickel Plated

For use on double swing doors, heavy pattern.



The "Kirby" Cast Bronze Sliding Door Catch

No. 353 Cast Bronze

No. 354 Nickel Plated

Catch is of cast bronze. Used for locking light sliding doors.



No. 1



No. 2



No. 3



No. 4



No. 5



No. 6



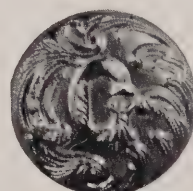
No. 7



Special



Special



Special

Fancy Special Knobs

- | | |
|---|---|
| No. 1 High Bronze Finish (Round) Standard | No. 5 High Bronze Finish (Flush Cup $\frac{1}{2}$ in. recess) |
| 2 High Bronze Finish (Oval) | 6 High Bronze Finish (Tee) |
| 3 High Bronze Finish (Scroll) | 7 High Bronze Finish (Drop) |
| 4 High Bronze Finish (Shell) | |

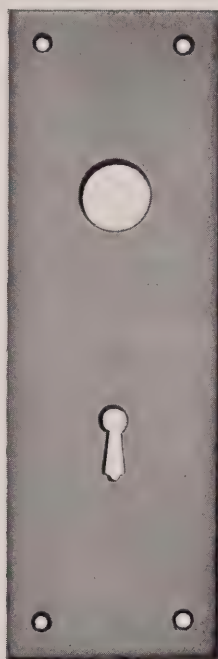
The round knob (No. 1) is always furnished unless otherwise ordered.



No. 1



No. 2



No. 3



No. 4



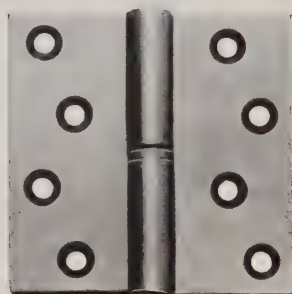
No. 5

Escutcheons

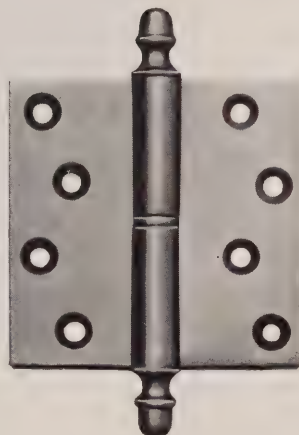
No. 1 High Bronze Finish (Standard)
 2 High Bronze Finish (Special)
 3 High Bronze Finish (Special)

No. 4 High Bronze Finish (Special)
 5 High Bronze Finish (Special)

Pattern No. 1 always furnished unless otherwise ordered. No. 2 may be substituted without extra cost.



Plain



Acorn

The "Kirby" Cast Bronze Butts

Heavy Cast Bronze Butts, Fitted with Composition Pins and Washers

Size	No. Screws Each	Size Screw
2 x 2	6	No. 6
2½ x 2½	6	No. 6
3 x 2½	8	No. 8
3 x 3	8	No. 8
3½ x 2½	8	No. 8
3½ x 3½	8	No. 10
4 x 4	10	No. 10
4½ x 4½	10	No. 10
5 x 5	10	No. 10

Other sizes to order.

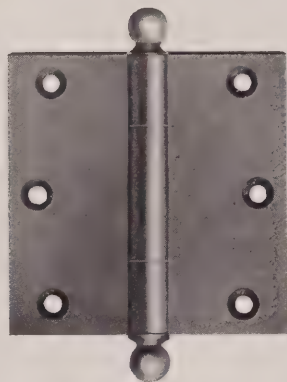
In ordering always give the size, finish, and whether acorn or plain butts are desired.

Suggestions for Ordering Butts

To determine if butts are to be right or left-hand, the following instructions should be observed:

Stand facing the center of the door so that it will swing towards you. If it is desired to have the butt on your right hand side, a *Left-Hand* Butt should be ordered; if on your left-hand side, order a *Right-Hand* Butt.

How Butts are measured: The first measurement is the length (not including acorns or balls), and the second measurement is the width of the Butt, when open.



Ball

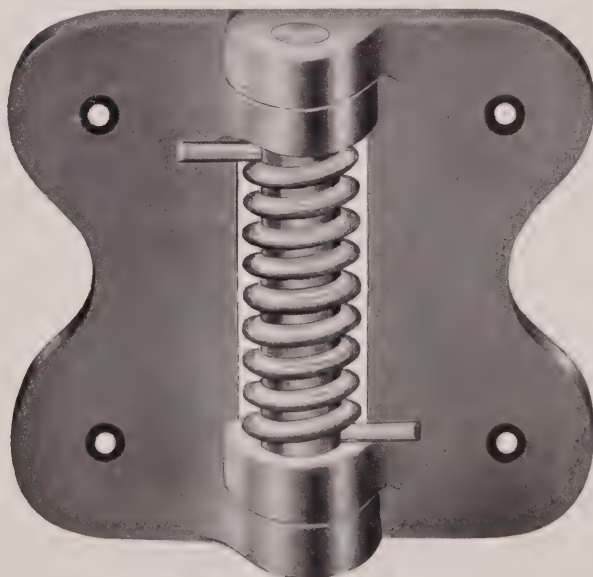
The “Kirby” Cast Bronze Butts

Size	No. Screws Each	Size Screw
2 x 2	6	No. 6
2½ x 2½	6	No. 6
3 x 2½	8	No. 8
3 x 3	8	No. 8
3½ x 2½	8	No. 8
3½ x 3½	8	No. 10
4 x 4	10	No. 10
4½ x 4½	10	No. 10
5 x 5	10	No. 10

Other sizes to order.

How Butts are measured: The first measurement is the length of the butt (not including the balls), and the second measurement is the width of the butt, when open.

How to Order: In ordering always give the size and finish.

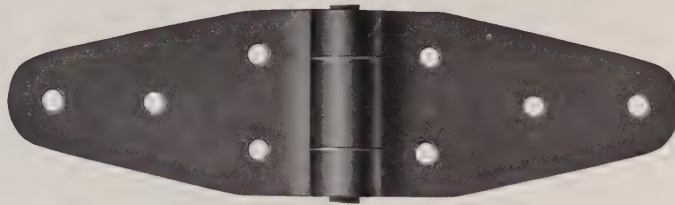


Cut is Full Size

The “Kirby” Cast Bronze Spring Hinge

	FINISH	Length	Extreme Width
No. 100	Bronze	2½ in.	2¾ in.
101	Nickel Plated	2½ in.	2¾ in.

For use on closet doors. The spring in the hinge holds the door closed.



The "Kirby" Heavy Cast Brass Strap Hinge

No. 363 Rough Brass

No. 364 Polished Brass

Heavy cast brass strap hinge for use on wood or steel doors.

Length, 12 inches; width, $3\frac{1}{4}$ inches.



The "Kirby" Extra Heavy Cast Brass Hasp

No. 366 Bronze

No. 367 Nickel Plated

Extra heavy hasp $7\frac{1}{2}$ inches long, $1\frac{1}{2}$ inches wide. $\frac{5}{8}$ -inch hole in staple.

In addition to the hinges shown here we are prepared to estimate on all kinds of hinges for heavy work in forged iron, cast iron or cast steel, for dredge buckets, large doors, etc.



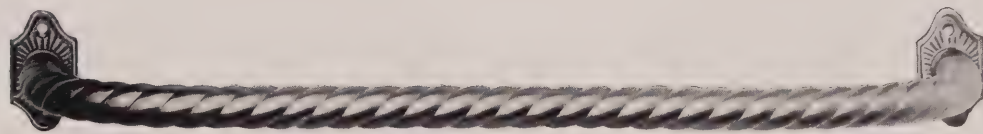
Roller Towel Rack

No. 102 Brass, Nickel Plated.....Length, 18 in.
Bar easily removed by slight pressure on knob.
May be furnished in any other length required.



Towel Rack with Teeth

No. 104 Brass, Nickel Plated.....Length, 12 in.
Teeth prevent towel from slipping off by vibration.
May be furnished in any other length required.



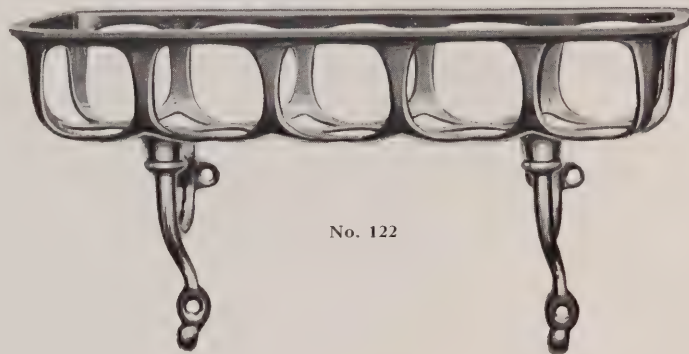
Towel Rack

No. 146 Nickel Plated.....Length 12 in. Stands out 3 in.



Tumbler Holder

No. 158.....Nickel Plated
A simple device for holding tumbler. Can be made to fit any size glass.



No. 122

The "Kirby" Cast Bronze Bracket Comb and Brush Holder

No. 122 Cast Bronze, Nickel Plated

Size..... 10 in. x 4 in.



No. 123

**The "Kirby"
Cast Bronze Bracket
Pitcher Holder**

No. 123 Cast Bronze, Nickel Plated

Size..... 9 in. x 5 ½ in.



No. 124

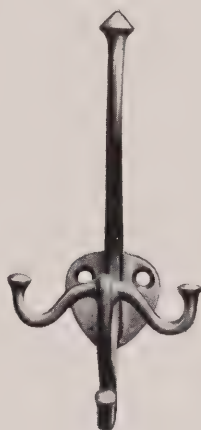
**The "Kirby"
Cast Bronze Bracket
Tumbler Holder**

No. 124 Cast Bronze, Nickel Plated

Size..... 3 in. x 6 in.



No. 160



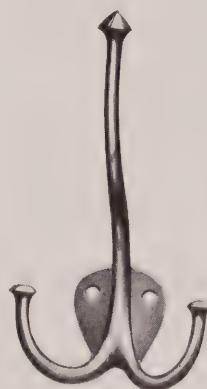
No. 168



No. 162



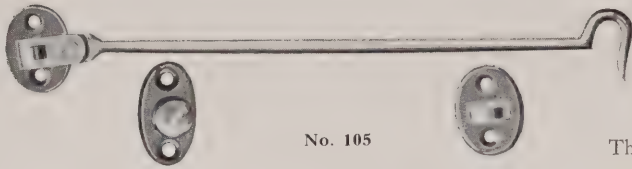
No. 165



No. 167

The "Kirby" Cast Bronze Coat and Hat Hooks

No. 160	Cast Iron, Brass Plated	Height, 5 in.
161	Cast Bronze	Height, 5 in.
162	Malleable Iron, Brass Plated	Height, 5½ in.
163	Cast Bronze	Height, 5½ in.
165	Cast Bronze	Height, 4 in.
166	Cast Bronze, Nickel Plated	Height, 4 in.
167	Cast Bronze	Height, 5½ in.
168	Cast Bronze (four prongs)	Height, 6¾ in.
169	Cast Bronze, Nickel Plated	Height, 5½ in.
170	Cast Bronze, Nickel Plated (four prongs)	Height, 6¾ in.

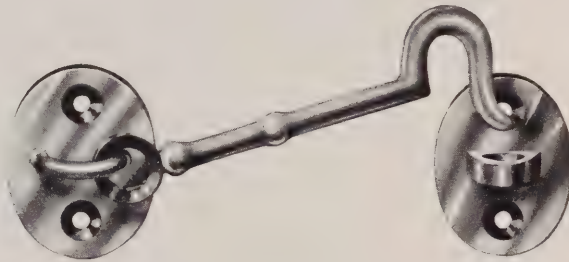


No. 105

Swivel Door Hook

No. 105 Cast Bronze...Length, 3 to 12 in.
106 Cast Bronze, Nickel Plated
Length.....3 to 12 in.

The Swivel makes it adaptable to any position.



No. 226

The "Kirby" Cast Bronze Cabin Door Hook

No. 226	Heavy Cast Bronze.....	Size, 3½ in.
227	Heavy Cast Bronze for Iron Doors.....	Size, 3½ in.
228	Heavy Cast Bronze.....	Size, 6 in.
229	Heavy Cast Bronze.....	Size, 12 in.

These hooks made in any other length desired. Special finishes to order.

The "Kirby" Bronze Window and Sash Catch

No. 184 Bronze

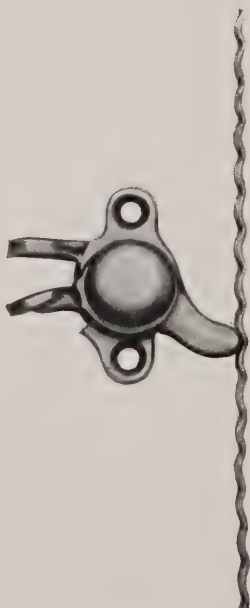
No. 185 Nickel Plated

Eighteen inches of crimped brass strip is furnished with each catch.

This window and sash catch may be furnished either right or left, but right is always supplied unless otherwise ordered.

The advantage of this catch is that it will hold the sash at any point, at the same time pressing it against the jam, eliminating all noise and rattle.

The sash lift, described below, should be used to raise and lower the sash.



No. 184
Right-Hand



No. 196

Cast Bronze Sash Lift

No. 196 Bronze

No. 197 Nickel Plated

The "Kirby" Cast Bronze Window and Sash Catch

No. 187 Cast Bronze

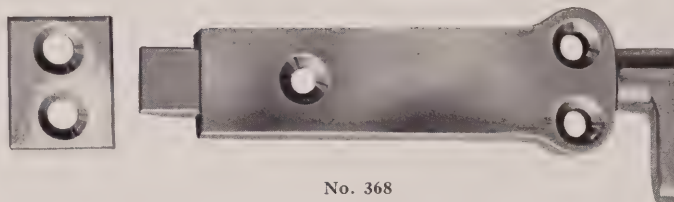
No. 188 Nickel Plated

Eighteen inches of cast brass strip furnished with each catch.

This window and sash catch can be furnished either right or left, but right is always supplied unless otherwise ordered.



No. 187
Right-Hand



No. 368

The "Kirby" Cast Bronze Window Bolt

No. 368 Brass

No. 369 Nickel Plated

Designed for use on top rail of lower sash to make sash rigid and prevent rattling.



No. 96

The "Kirby" Cast Bronze Lever Side Sash Lock

No. 96 Cast Bronze, highly finished.....Size, 2½ in. x 1½ in.

98 Cast Bronze, Nickel Plated.....Size, 2½ in. x 1½ in.

Made with eccentric lever, quick acting, and holds sash at any desired point.

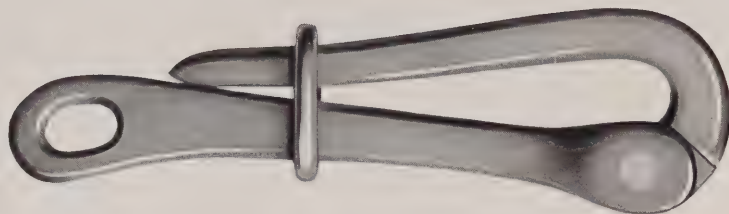


No. 42

Heavy Cast Bronze Flush Sash Lift

No. 42 Cast Bronze, highly finished.....Size, 3¼ in. x 1¼ in.

43 Cast Bronze, Nickel Plated.....Size, 3¼ in. x 1¼ in.



No. 376

The "Kirby" Davit Stay Release

No. 376.....Length, 7½ in.
Cast brass extra heavy hook used for lashing and releasing davit stays.

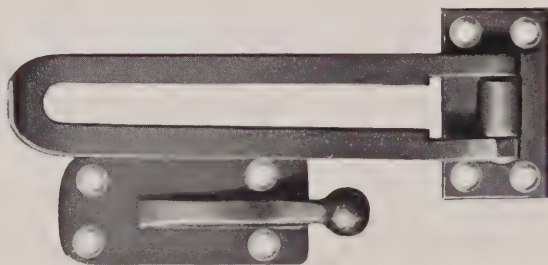
Transom Opener With Cast Bronze Fittings

No. 212 Bronze, high finish
No. 216 Nickel Plated

The regular size is made 18 inches long, with 11-inch opening of arms.
Any length or opening can be furnished.



No. 212



No. 61

The "Kirby" Flush Safety Cast Bronze Door Fastener

No. 61 Cast Bronze, high finish
.....Size, 6 in. x 1½ in.



No. 62

The "Kirby" Safety Cast Bronze Door Fastener

For Doors Not Flush

No. 62 Cast Bronze, high finish
.....Size, 6 in. x 1½ in.

For use on state room doors.

When in position, door cannot be opened further than length of hasp.

The use of this fastener makes it impossible to open door from outside.

Furnished for doors flush with pilasters or otherwise.

Special finishes to order.



No. 111



No. 112

The "Kirby" Cast Bronze Berth Handle

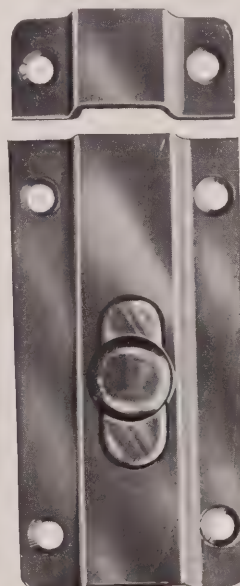
No. 111 Cast Bronze, Nickel Plated.....Length, 6½ in.
Designed to facilitate entering upper berth in state rooms. Strong and substantial.

The "Kirby" Cast Bronze State Room Hammock Hook

No. 112 Cast Bronze, Nickel Plated.....Size, 2 in. x 1½ in.
For supporting state room parcel hammocks.



No. 355



No. 63

The "Kirby" Sash Handle

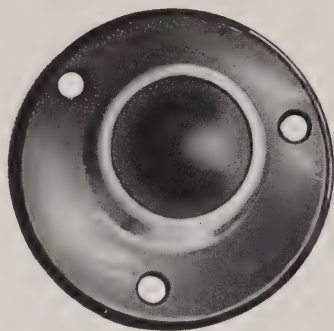
No. 355 Bronze.....No. 356 Nickel Plated
Cast bronze handle 4½ inches long, for use on light doors, drawers or sash.

Cast Bronze Slide Bolt

Highly Finished

No. 63	Large.....	Size, 5 in. x 2 in.
64	Medium.....	Size, 4 in. x 2 in.
65	Small.....	Size, 4½ in. x ¾ in.

A practical design, and very strong. For use on double doors.



No. 86



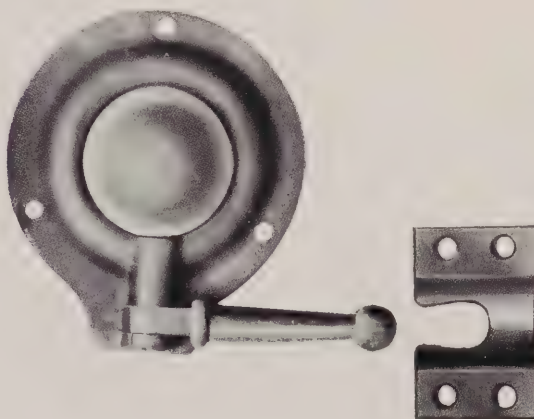
No. 92

The "Kirby" Cast Bronze Flat Door Bumper

- | | | |
|--------|------------------------------|---------------------|
| No. 86 | Cast Bronze, highly finished | Size, 2 in. x 1 in. |
| 87 | Cast Bronze, Nickel Plated | Size, 2 in. x 1 in. |

The "Kirby" Cast Bronze Spindle Door Bumper

- | | | |
|--------|------------------------------|----------------------|
| No. 92 | Cast Bronze, highly finished | Size, 3 in. x 2½ in. |
| 93 | Cast Bronze, Nickel Plated | Size, 3 in. x 2½ in. |



The "Kirby" Cast Bronze Combination Door Bumper and Hook

- | | |
|---------|-------------|
| No. 019 | Cast Bronze |
|---------|-------------|
- This door bumper may also be used as a hook to hold door.



The "Kirby" Cast Bronze Door Stop

- | | |
|---------|------------------------------|
| No. 223 | Cast Bronze, highly finished |
|---------|------------------------------|
- A simple attachment to hold door open. It occupies but little space. By pushing door against it, will hold door open; a slight pull of the door releases it.
- Other finishes, if desired.



Drinking Alcoves

- No. 267 Nickel Plated Width, 10 in.
268 Nickel Plated Width, 20 in.
Other sizes and finishes to order.



Cast Bronze Name Plates 12 x 1½ inches

We can furnish Cast Bronze Name Plates, lettered to order. The letters are antique pointed type, with high finish face on rough background.

Can also furnish Cast Bronze Name Plates for ship and engine builders from designs furnished.



The "Kirby" Hurricane Lamp

High Bronze Finish, Dual Burners

No. 234

Diameter of Globe, 7 in.

Height, 19 in.

Extra globes, chimneys, dual burners, wire guards or wicks and special finishes furnished to order.

This lamp is made of heavy spun brass, strong and suitable for exposed places.

The oil well, burner and chimney are held in the support and globe by phosphor-bronze spring catches, which retain them firmly in place.

Guaranteed not to flicker nor blow out.

The "Kirby" Bracket Lamp

High Bronze Finish, Single Burner

No. 245

Diameter of Body, 4 $\frac{3}{4}$ in.

Height, 14 in.

Extra chimneys, unique burners or wicks and special finishes furnished to order.

Lamp suitable for use in protected places, such as state rooms.

Oil reservoir, which is independent of the outside body, can be removed for filling. The outside body catches any possible leakage or overflow, thus keeping the exterior of the lamp clean.

The reservoir is held in place by means of phosphor-bronze springs.

Complete with Smoke Bell.





The "Kirby" Cast Bronze Side Pulls For Signal Bells

No. 428 Bronze, highly finished ----- Length, 13 in.

Any finish desired can be furnished. Other sizes or designs to order.

Also manufactured to be operated electrically, used in place of push button.

No. 361 Bronze.

No. 362 Nickel Plated.



The "Kirby" Cast Bronze Whistle Zone or Crank

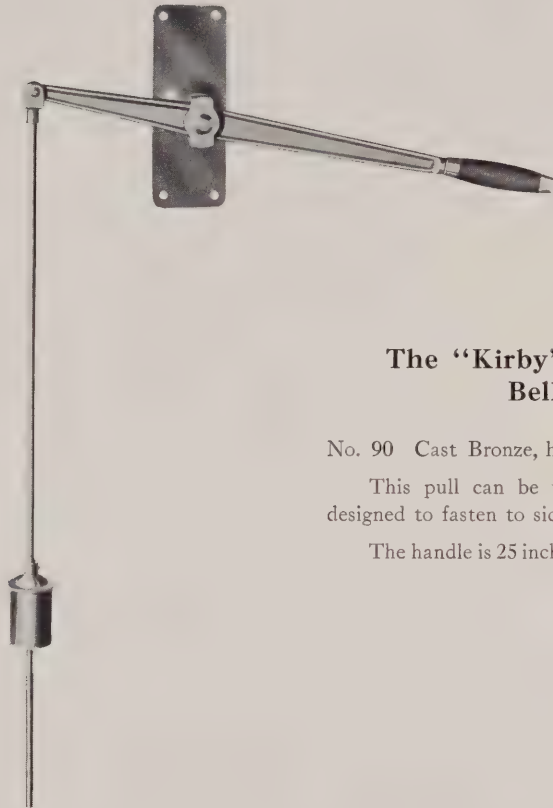
No. 430 Right, Bronze, highly finished.

No. 431 Left, Bronze, highly finished.

Length, 16 in.

Length, 16 in.

A strong lever pull for use on bridge and pilot house top. The Right zone is for pulling *to the Right*; Left for pulling *to the Left*.



The "Kirby" Cast Bronze Horizontal Bell or Whistle Pull

No. 90 Cast Bronze, highly finished

This pull can be used in place of the vertical pull, and is designed to fasten to side of railing.

The handle is 25 inches long, and the base measures 10 in. x $3\frac{1}{2}$ in.

The "Kirby" Cast Bronze Vertical Bell or Whistle Pull

No. 91 Cast Bronze, high finish

This pull, used on modern freight boats, has given entire satisfaction.

Base, $6\frac{1}{2}$ in. x $10\frac{3}{4}$ in.; height from base to quadrant, 19 in.; height over all, 37 in.



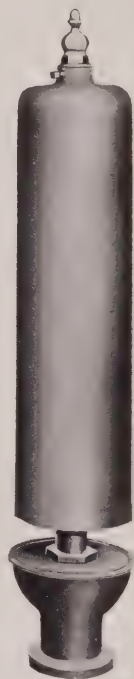
Steam Whistle

Diameter of Bell, 4 in.	Length of Bell, 18 in.	Size of Steam Pipe, 1½ in.
Diameter of Bell, 6 in.	Length of Bell, 20 in.	Size of Steam Pipe, 1½ in.
Diameter of Bell, 8 in.	Length of Bell, 30 in.	Size of Steam Pipe, 2 in.
Diameter of Bell, 8 in.	Length of Bell, 48 in.	Size of Steam Pipe, 2½ in.
Diameter of Bell, 10 in.	Length of Bell, 30 in.	Size of Steam Pipe, 2½ in.
Diameter of Bell, 10 in.	Length of Bell, 36 in.	Size of Steam Pipe, 2½ in.

The bell is made of copper, other parts are brass and iron.

Whistles are tested before leaving factory.

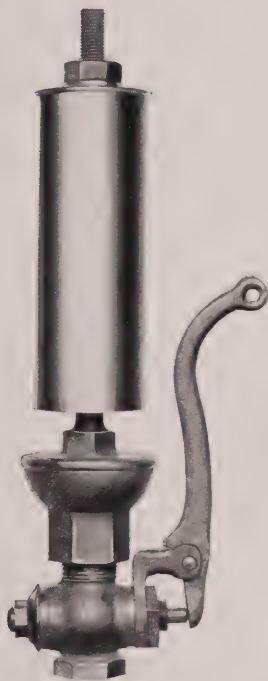
Can also be furnished made entirely of copper and brass.



The "Kirby" Signal Whistle and Valve

No. 372	Size, 2½ in. x 7½ in., Brass Bell	Connection, ¾ in.
No. 373	Size, 3 in. x 12 in., Brass Bell	Connection, 1 in.

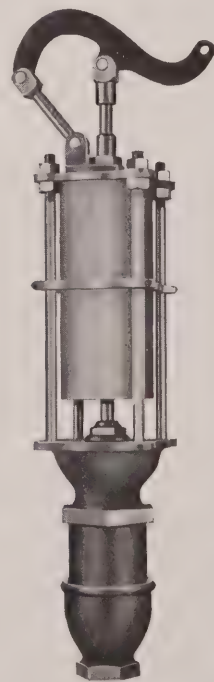
For steam pressures up to 250 pounds.

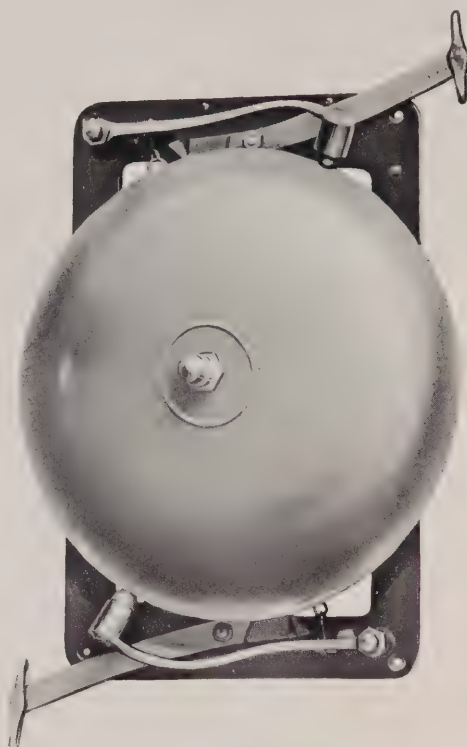


Mocking Bird Whistle

No. 365	Length, 30 in.	Steam connection, 2 in.
---------	----------------	-------------------------

Has 5 in. x 11 in. copper bell and heavy cast brass base. Different tones may be produced by raising or lowering plunger. Suitable for tugs, factories, fire alarms, and where a distinctively toned whistle is required.





The "Kirby" Cast Bronze Double Trip Gong

No. 51	Cast Bronze, highly finished.....	Size, 8 in.
52	Cast Bronze, highly finished.....	Size, 10 in.
53	Cast Bronze, highly finished.....	Size, 12 in.
54	Cast Bronze, highly finished.....	Size, 14 in.
55	Cast Bronze, highly finished.....	Size, 16 in.
56	Cast Bronze, highly finished.....	Size, 18 in.

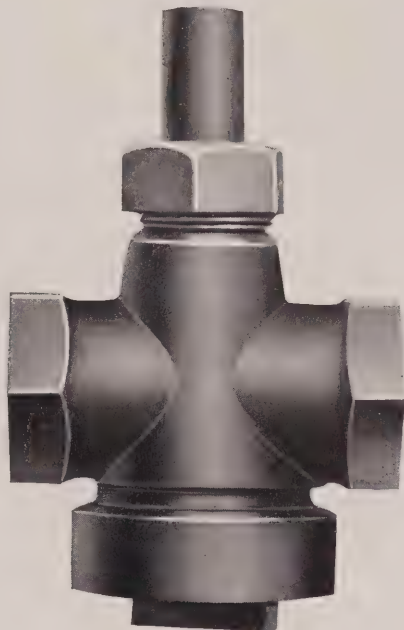
This gong has a cast iron frame, gong made of superior bell metal. Springs of phosphor-bronze wire. Hammers and pulls of cast bronze. Gongs also made single trip.



The "Kirby" Cast Bronze Ship Trim Indicator

No. 442	Bronze, high finish.....	Width, 24 in.	Height, 18 in.
443	Nickel Plated.....	Width, 24 in.	Height, 18 in.

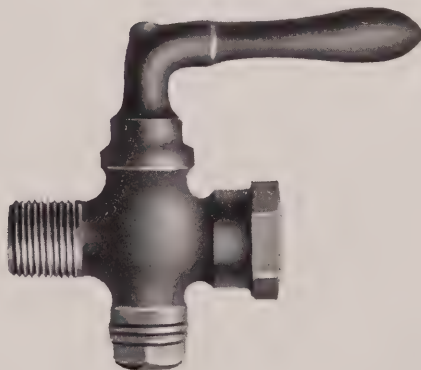
A practical and reliable device for indicating when a vessel is in trim, or if listed, the number of degrees of list.



The "Kirby" Cast Bronze Drain Cock

No. 382	Size, 1 in.	Diameter of Stem, $\frac{7}{8}$ in.
383	Size, $1\frac{1}{4}$ in.	Diameter of Stem, 1 in.
384	Size, $1\frac{1}{2}$ in.	Diameter of Stem, $1\frac{1}{8}$ in.
385	Size, 2 in.	Diameter of Stem, $1\frac{1}{4}$ in.

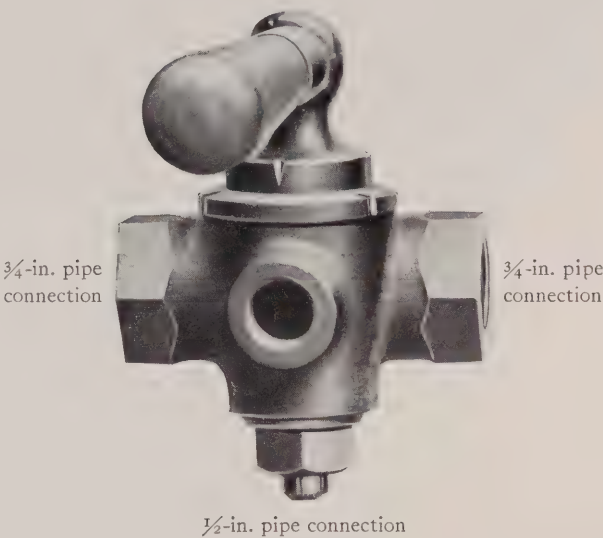
Made of extra heavy cast bronze for steam pressures up to 250 pounds. Has removable stop which can be changed to either right or left hand.



The "Kirby" Lever Handle Stop Cock

No. 374	Rough Brass	Size, $\frac{3}{8}$ in.
375	Rough Brass	Size, $\frac{1}{2}$ in.

Heavy cast brass, with male and female ends.



Extra Heavy Cast Bronze 3-Way Indicator Cock

No. 121 Cast Bronze.....Size, 6 in. x 4 1/4 in.
A high grade cock, especially suitable for indicator connections.



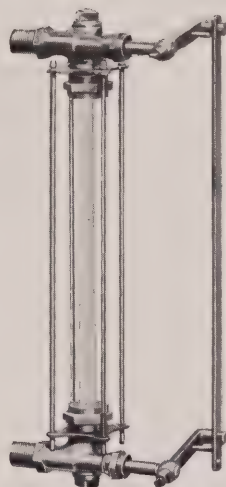
Front View

Extra Heavy Cast Bronze Balanced Whistle Valve

- | | | |
|---------|---------------------------------|-----------------|
| No. 203 | Screwed Valve, Cast Bronze..... | Size, 2 1/2 in. |
| 204 | Flanged Valve, Cast Bronze..... | Size, 2 1/2 in. |
| 205 | Screwed Valve, Cast Bronze..... | Size, 3 in. |
| 206 | Flanged Valve, Cast Bronze..... | Size, 3 in. |

An extra heavy balanced whistle valve, made with either flanged or screwed ends (specify which type when ordering).

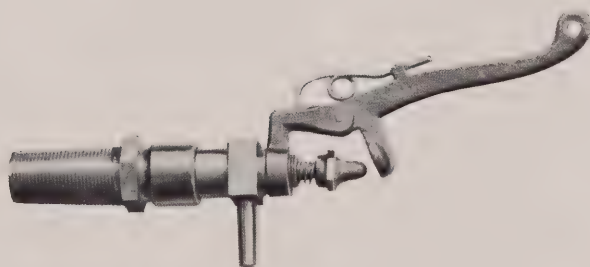
By unscrewing the side cap, all working parts may be removed.



Cast Bronze Water Gauge Mountings

No. 120 Cast Bronze, highly finished

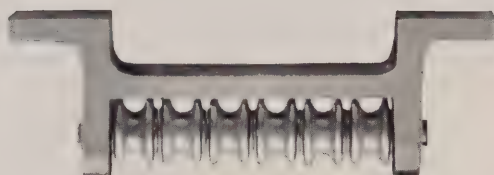
Fitted for $\frac{3}{4}$ -inch steam connections. First class in every respect. Quick opening and closing. Mountings, complete with glass and rods, included without extra charge. When ordering state distance between centers.



The "Kirby" Cast Bronze Try Cock

No. 175 Cast Bronze.....Size, $\frac{3}{4}$ in. x $11\frac{1}{4}$ in.

For boilers on lake steamers.

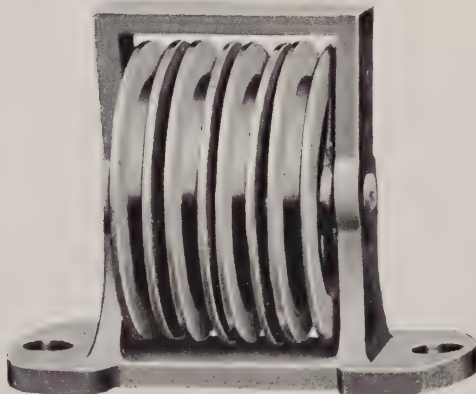


Fairleaders

No. 386	Rough Brass	1 Wheel
387	Rough Brass	2 Wheel
388	Rough Brass	3 Wheel
389	Rough Brass	4 Wheel
390	Rough Brass	5 Wheel

Cast brass frame, turned brass wheels.

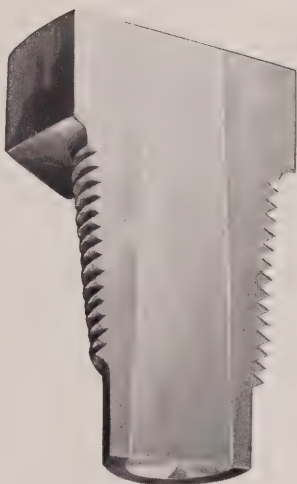
Can be made up with as many wheels as desired.



Cast Bronze Sheaves

No. 70	Cast Bronze	Vertical, 1 Wheel
71	Cast Bronze	Vertical, 2 Wheel
72	Cast Bronze	Vertical, 3 Wheel
73	Cast Bronze	Vertical, 4 Wheel
74	Cast Bronze	Vertical, 5 Wheel
No. 75	Cast Bronze	Horizontal, 1 Wheel
76	Cast Bronze	Horizontal, 2 Wheel
77	Cast Bronze	Horizontal, 3 Wheel
78	Cast Bronze	Horizontal, 4 Wheel
79	Cast Bronze	Horizontal, 5 Wheel

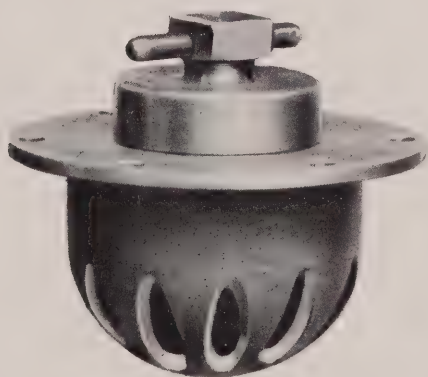
$\frac{1}{4}$ -inch brass sprocket chain is used in connection with these sheaves.



Fusible Boiler Plugs

No. 20.....Size, $\frac{3}{4}$ in. Tap.
21.....Size, 1 in. Tap.

Bronze bars filled with pure Banca tin, manufactured in accordance with requirements of U. S. Steamboat Inspection Service.



Self Bailing Plug

No. 33 Cast Bronze.....Size, $3\frac{1}{2}$ in. x $3\frac{1}{2}$ in.

Designed for equipping life boats and are fitted with a rubber ball, which acts as an automatic valve.



No. 379

Engine Room Telegraph Indicator Head

Made with iron enameled dial, 15 inches diameter, fitted with turnbuckle connections. All working parts of best bronze metal. Trip dog tip fitted with anti-sticking roller so handle cannot bind.



Single Face Docking Telegraph Transmitter

No. 377 Height, 46 in. Face, 15 in. diameter
Base, 14 in. diameter

Body made of cast brass, working parts of bronze.

Has a transparent porcelain dial illuminated by two 8 candle power electric lamps enclosed in head and operated by switch in back of head, fitted with turnbuckle connections; all working parts in head are easily accessible by removing rear plate.



No. 378



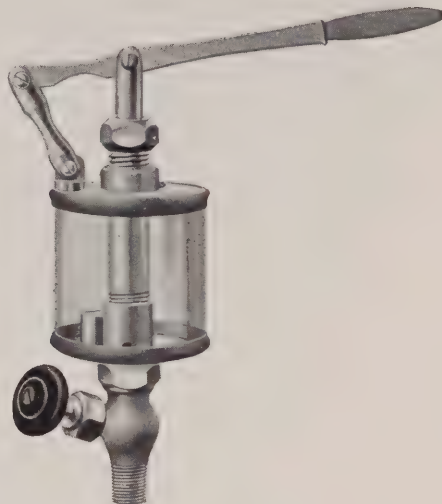
No. 377

Single Face Engine Telegraph Transmitter

No. 378 Height, 46 in. Face, 15 in. diameter
Base, 14 in. diameter

Body of cast brass, working parts of bronze.

Has transparent porcelain dial, illuminated by two 8 candle power electric lamps enclosed in head and operated by switch in back of head; fitted with turnbuckle connections; all working parts in head are easily accessible by removing rear plate.



The "Diamond" Lever Handle Glass Body Oil Pump

This Pump is substantially built, has "pump" valves in both *suction* and *discharge* as well as a needle point valve in the standard. Having a lever handle in place of the direct plunger, the pump has greater force for working against a high pressure. Metal cylinder in place of the glass may be furnished.

No. 200	Capacity, 4 oz.	Diameter of Glass, $2\frac{3}{8}$ in.	Height of Glass, $2\frac{1}{2}$ in.	Shank, $\frac{3}{8}$ in.
201	Capacity, 10 oz.	Diameter of Glass, $3\frac{1}{8}$ in.	Height of Glass, $2\frac{3}{8}$ in.	Shank, $\frac{1}{2}$ in.
202	Capacity, 1 pt.	Diameter of Glass, $3\frac{1}{2}$ in.	Height of Glass, $4\frac{1}{2}$ in.	Shank, $\frac{1}{2}$ in.
203	Capacity, 1 qt.	Diameter of Glass, $4\frac{3}{8}$ in.	Height of Glass, $4\frac{1}{2}$ in.	Shank, $\frac{1}{2}$ in.

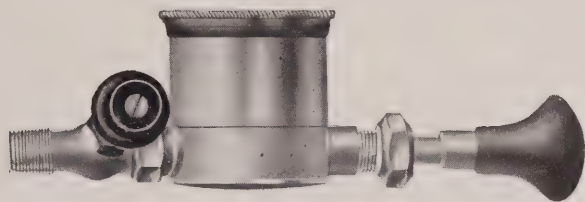
Shank always threaded for standard pipe unless otherwise ordered.



The "Kirby" Two-Quart Cast Bronze Oil Pump

No. 40 Cast Bronze, high finish.....Size, 14 in. x 6 in.

A high grade oil force pump of heavy bronze with $\frac{1}{4}$ -inch pipe connections.



The "Ruby" Hand Cylinder Oil Pump

There are many places where a hand pump is wanted as an auxiliary oiler, or where it is more convenient than either a lubricator or an oil cup. Besides having a needle point valve in the standard as part of the pump, both *suction* and *discharge* have pump valves, making it positive in its action. When so ordered, we make with standard below the body of the pump, for connecting to top of steam chest or cylinder, as well as in the horizontal position, for fastening into steam pipe or steam chest.

No. 700	Capacity, $\frac{1}{4}$ pint	Size of Bowl, $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in.
701	Capacity, $\frac{1}{2}$ pint	Size of Bowl, 3 in. x 3 in.
702	Capacity, 1 pint	Size of Bowl, $3\frac{3}{4}$ in. x $3\frac{3}{4}$ in.



No. 60

Sixty-Gallon Oil Tank

No. 60 Galvanized Steel-----Size, 25 in. x 46 in.

Heavy galvanized steel tank, painted. Fitted with force pump.

Special tanks made to order.

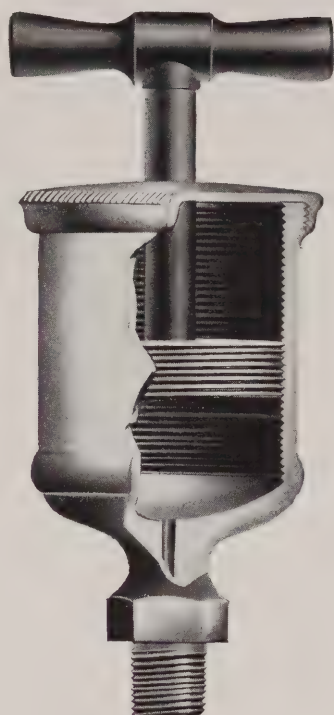


No. 381

Spun Steel Squirt Can

No. 381 Height, $7\frac{1}{4}$ in. Spout, $4\frac{1}{2}$ in. long.

Made of special spinning steel, tinned, with spring bottom.



The "Majestic" Cast Bronze Compression Dope Cup

"T" Handle

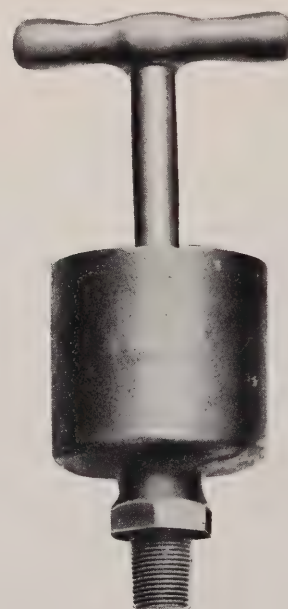
Sizes	A	B	C	D	E	G
Capacity, ounces	$\frac{3}{4}$	$1\frac{1}{2}$	3	$4\frac{1}{2}$	7	10
Diameter, outside, inches	$1\frac{1}{4}$	$1\frac{5}{8}$	2	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$
Shank, inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$

Spring top and other styles of dope cups made to order. Brass or nickel plated.

Iron Body Brass Plunger Dope Cup

- No. 66 Iron Body, Brass Plunger.....Size, 2 in. x $2\frac{1}{4}$ in.
 67 Iron Body, Brass Plunger.....Size, 3 in. x $4\frac{1}{4}$ in.
 68 Iron Body, Brass Plunger.....Size, 3 in. x $7\frac{1}{4}$ in.

These cups have iron body and brass plunger.



Cast Bronze Dope Cup

- No. 45 Cast Bronze, high finish.....1 quart

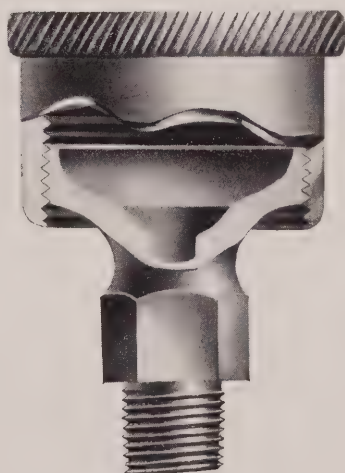
Bronze Dope Cup, capacity 1 quart, constructed especially for use on main and other large bearings. Fitted for $\frac{3}{4}$ -inch pipe connection.

Tee handle on plunger makes it easily operated.



Compression Cast Bronze Dope Cup

No. 35 Cast Bronze, high finish Pipe Thread, $\frac{1}{2}$ in. Size, 8 in. x $3\frac{1}{4}$ in.
Compressed by screwing down top, heavy cast bronze.

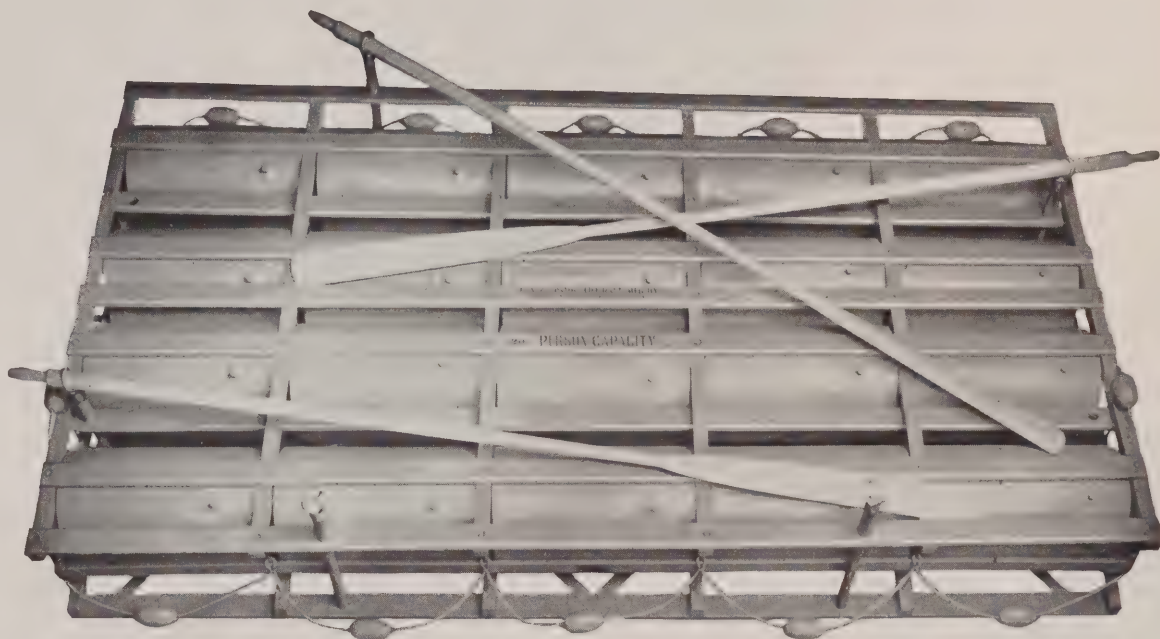


The "Mutual" Cast Bronze Grease Cup

Hand Compression

No. 01	Pipe Thread, $\frac{1}{8}$ in.	Size, 1 in.
01 $\frac{1}{4}$	Pipe Thread, $\frac{1}{4}$ in.	Size, 1 $\frac{1}{4}$ in.
01 $\frac{1}{2}$	Pipe Thread, $\frac{1}{4}$ in.	Size, 1 $\frac{1}{2}$ in.
02	Pipe Thread, $\frac{3}{8}$ in.	Size, 2 in.

Bronze or nickel plated.



The "Clark" Metallic Life Raft

Latest revised type, built according to Rules and Regulations of United States Board of Supervising Steamboat Inspectors. Each raft is equipped with oars, oarlocks, life lines and floats and paddles.

Rafts are composed of independent galvanized iron tanks, securely fastened together in a wooden frame thoroughly braced and bolted. Tanks are constructed of galvanized iron with flanged heads, double riveted and soldered. Each tank fitted with brass testing flange and cap for air pump connection; tested and painted before being assembled in framework.

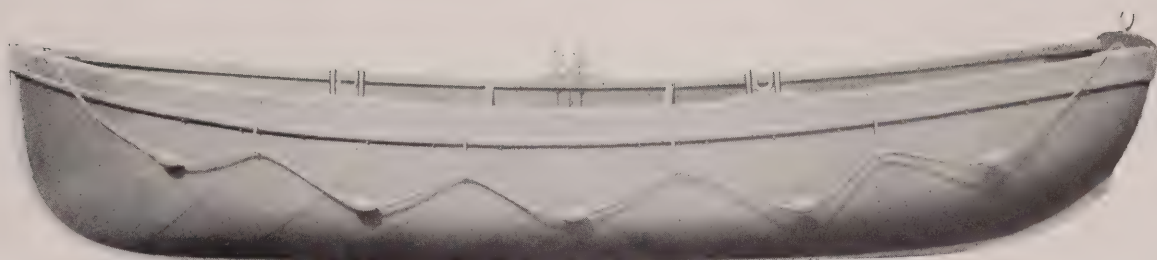
Some of the special advantages of this raft are its many units of buoyancy. It is always right side up, either side being equally suitable for use. Thus when thrown overboard it is immediately ready for passengers.

It floats high in the water and furnishes many places where it may be easily and securely grasped. It may be conveniently stowed on shipboard and several rafts may be piled one on top of another.

One or all tanks in raft may be easily removed for repairs or painting by simply unscrewing top strips.

Made in following capacities:

4 persons	8 persons	20 persons	35 persons
5 persons	10 persons	25 persons	40 persons
6 persons	15 persons	30 persons	



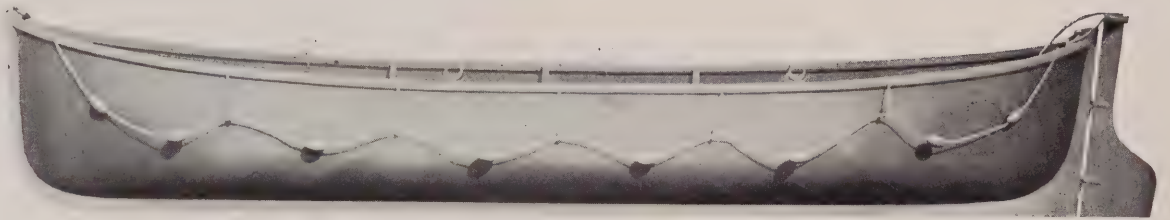
Type "A 1"

The "Kirby" Square Stern Life Boat

Built in strict accordance with requirements of United States Steamboat Inspection Service; of galvanized sheet steel, diagonally plated, steel keel, independent air tanks.

Strictly first class throughout.

Lengths: 18 ft., 20 ft., 22 ft. and 24 ft.



Type "B 1"

Double End Life Boat

Built in strict accordance with requirements of United States Steamboat Inspection service; of galvanized sheet steel, diagonally plated, steel stem, keel and stern post, independent air tanks.

Strictly first class throughout.

Lengths: 18 ft., 20 ft. and 22 ft.



Electric Fixtures

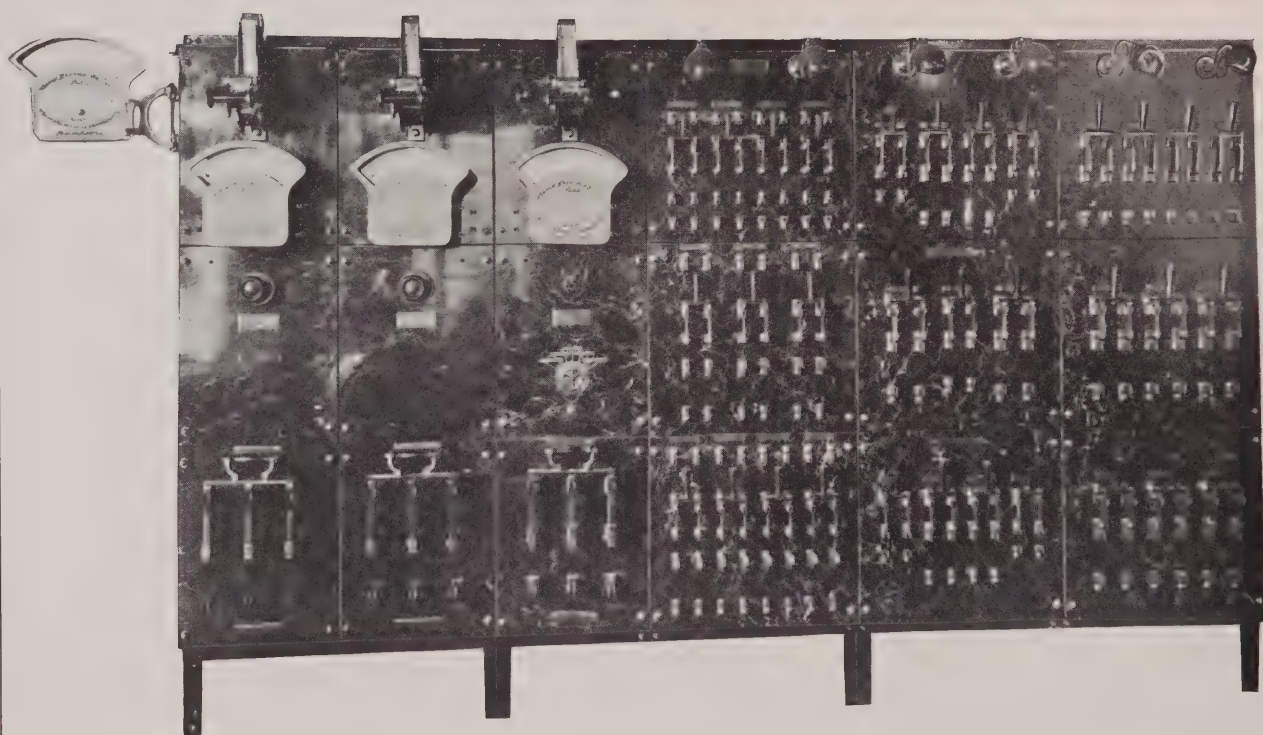
THE electrical fixtures, fittings and appliances, shown on the following pages, are the result of a very careful study of marine requirements. We have endeavored to make this line as simple, rugged, compact and interchangeable as is consistent with modern practice.

Special attention is called to the new junction or outlet box and the very complete line of interchangeable fittings for same.

We are prepared to build switchboards, distributing panels and charging panels of any size, and for any purpose.

We are having manufactured a flexible cable, in both two and three-conductor size, that will retain its flexibility and stand the rough deck usage better than anything used heretofore. Prices and samples on application.

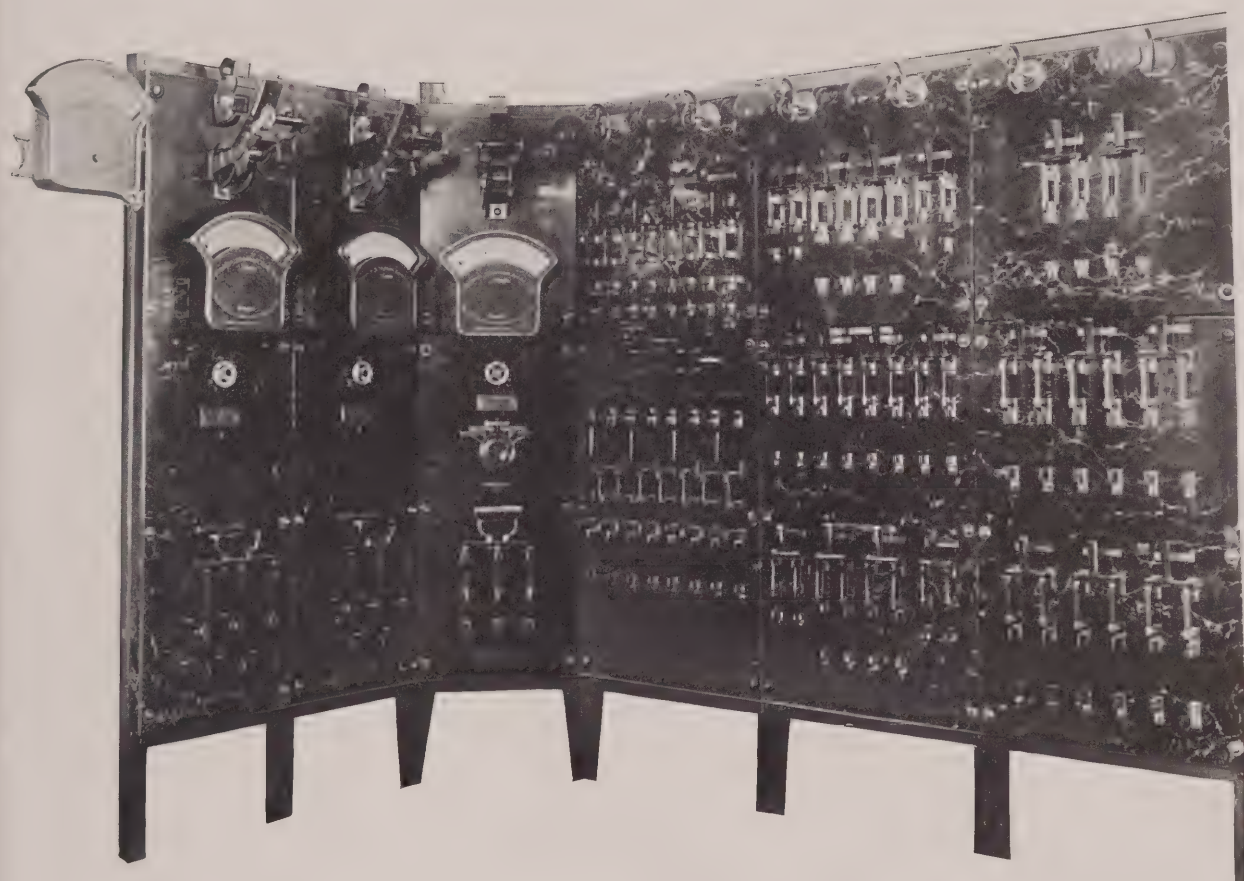
We carry a full line of marine wire of all sizes, conduit, lamps, etc., and will be pleased to quote prices on any quantity.



"Seeandbee" Switchboard

Main Switchboard built for the C. & B. Line passenger steamer "Seeandbee"

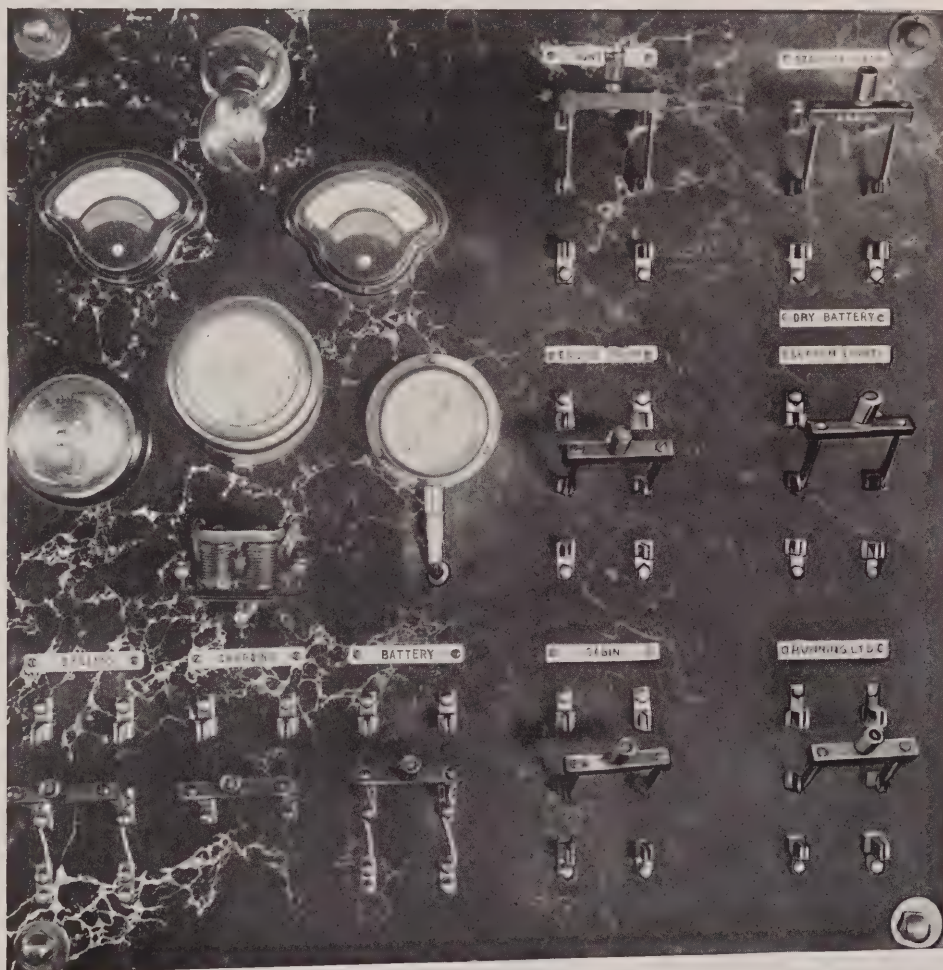
18 panels 6' 6" high 12' long



"City of Detroit III" Switchboard

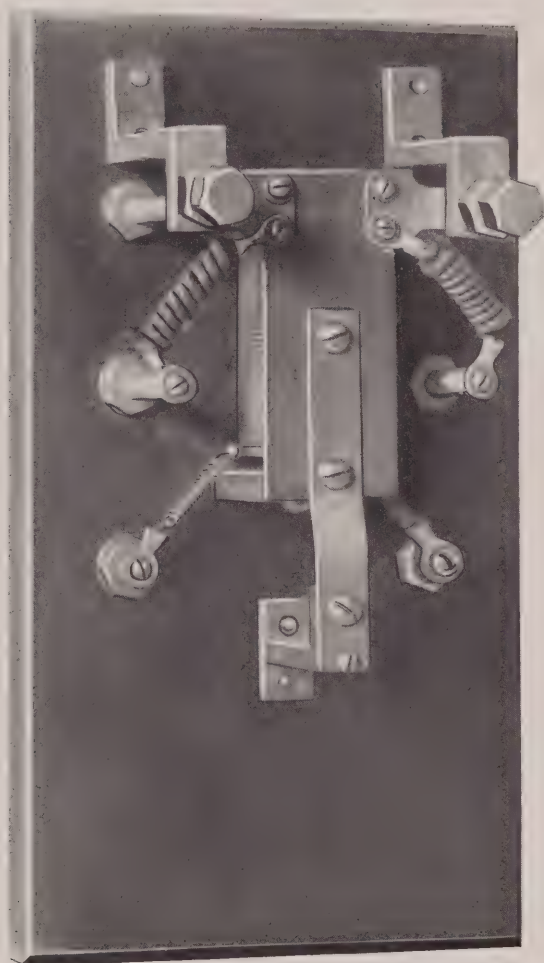
Main Power and Light Board, built for passenger steamer "City of Detroit III"

12 panels 6' high 12' long



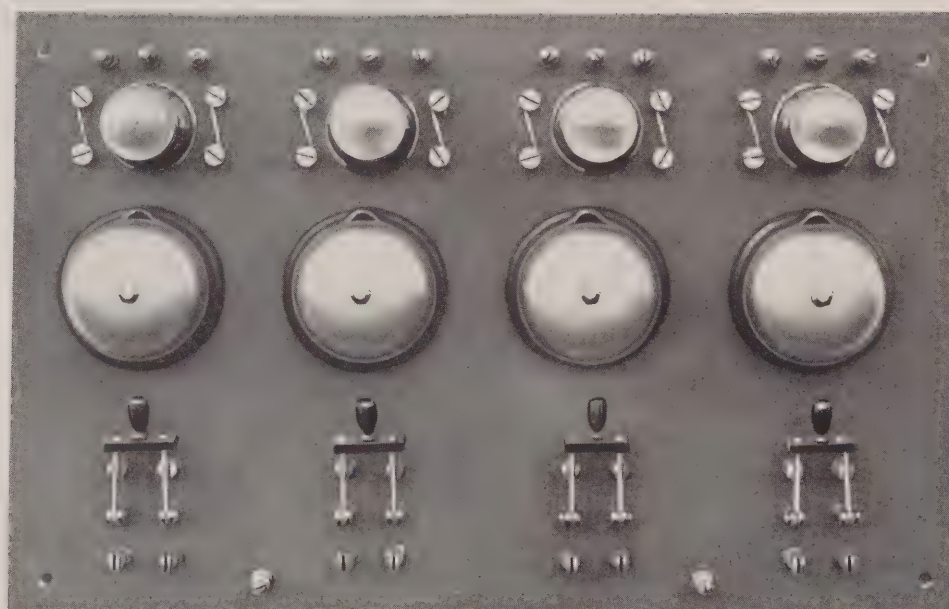
"Neptune" Switchboard

24 x 24-inch board built for cruising yacht "Neptune." This board is so designed that any lighting or ignition circuit can be operated from either storage battery or dynamo, or both. Storage battery is automatically charged through a differential relay. Ignition current can be had from dynamo, storage battery or dry cells. This is doubtless the most complete board of its size ever built.



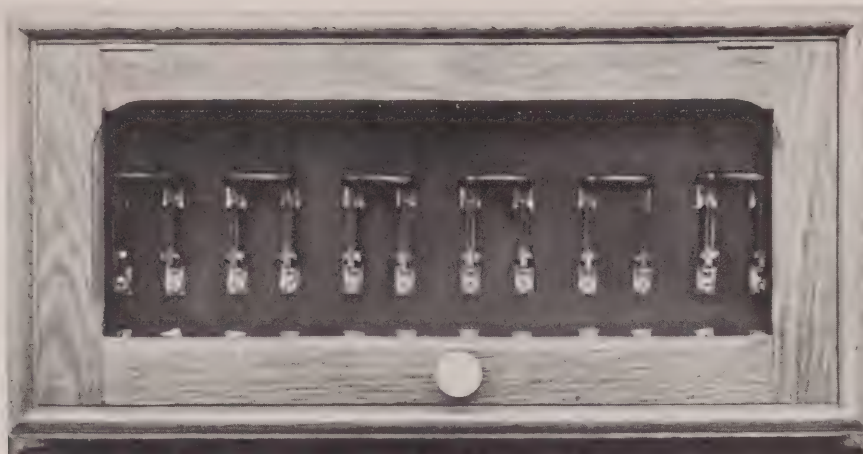
Relay for Electric Whistles, Etc.

Automatic relay for electric whistles, rudder indicators, etc. This simple device will operate electric whistle on dynamo current, when generator is running, and automatically switches over to storage battery when generator is shut down.



Pilot House Tell Tale No. 4

Our Pilot House "Tell Tale" is arranged with pilot lamps, which light up if the lamp in side or mast head lantern should go out. Double throw switches control the two lamps in each lantern, so that should one burn out, the other may be lighted by simply throwing the switch. Four lights, three wire circuits; for two masthead lights and two side lights.



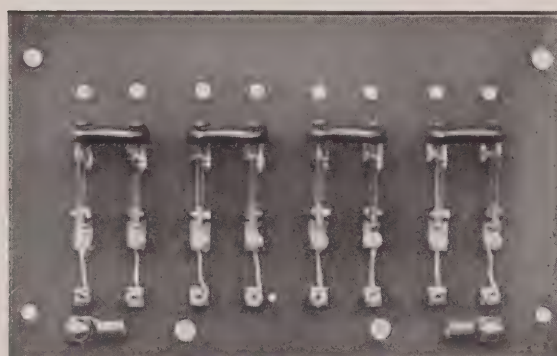
Panel or Tablet Boards and Cases

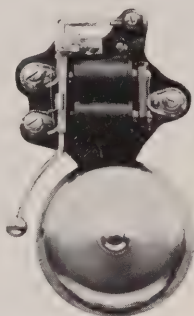
Distributing panels can be built for any number of circuits and to suit any specifications. The standard panels for lake freighters are:

No. 37	4 circuits	No. 38	5 circuits	No. 39	6 circuits
No. 40	7 circuits	No. 41	8 circuits		

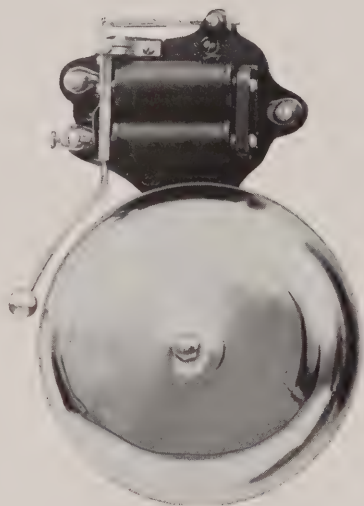
Cases take same numbers, only specify whether boards only, cases only, or both are wanted.

We also manufacture distributing and charging panels, automatic relays, etc., for use with marine storage batteries.





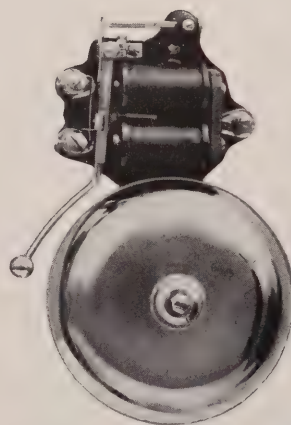
4-inch Bell



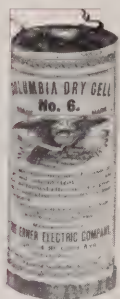
8-inch Gong



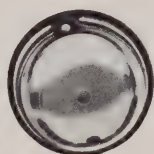
No. 66 General Alarm Sign



6-inch Gong



No. 6 Batteries



3-inch King Bell



Telephone



No. 67 General Alarm Switch



No. 6 Batteries

General Alarm Material

The material shown on this page is made to conform with Government Regulations for general alarm systems. In ordering bells and gongs, state whether they are to be used with storage batteries or dry cells.

Storage Batteries

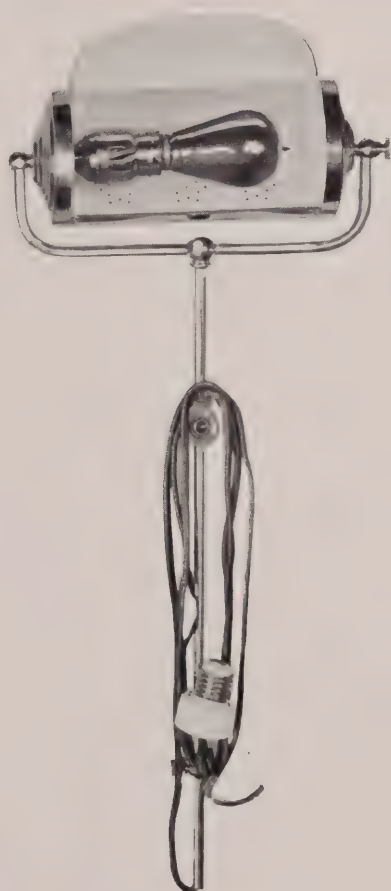
The use of storage batteries on the modern steamship has become almost a necessity. We can furnish 60 or 100 ampere-hour batteries in the 22-volt size, or in a double set of 12 volts each.

Telephones

The enameled steel case telephone shown in the cut is especially adapted for marine work. We strongly recommend this type for use between pilot house and engine room, also from pilot house to second mate.



Chart Lamp



Desk Lamp

Chart and Desk Lamps
Carried in Stock

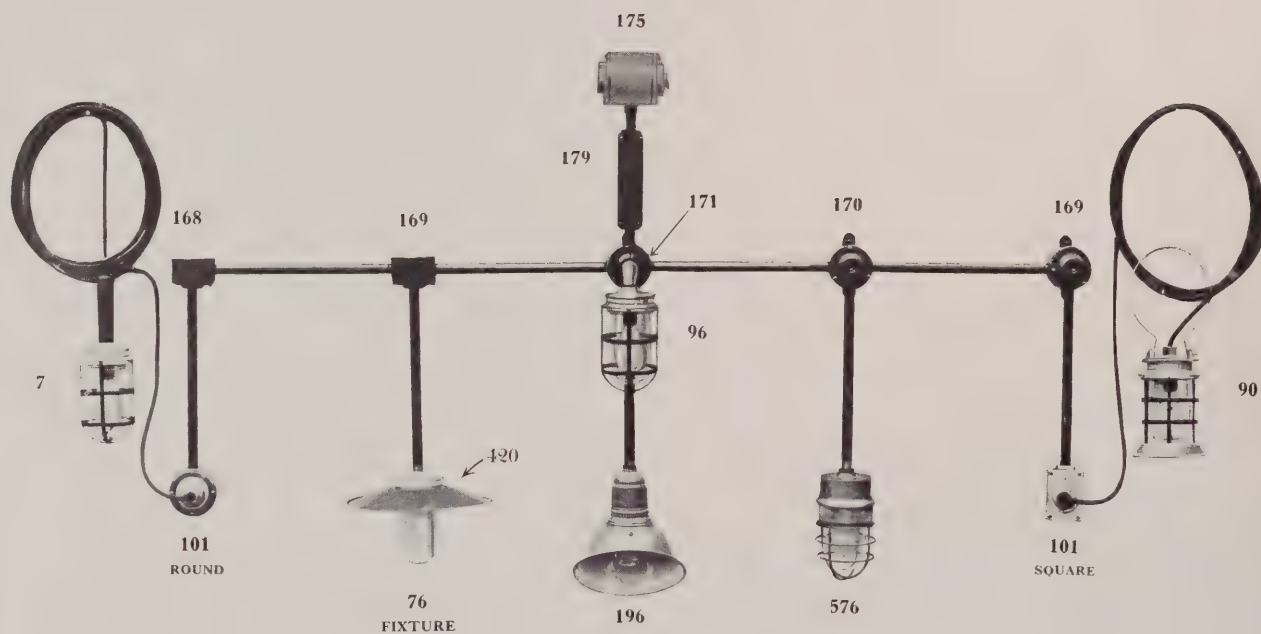


Diagram Showing Application of Conduit Fittings

Numbers refer to fittings illustrated between pages 174 and 187.

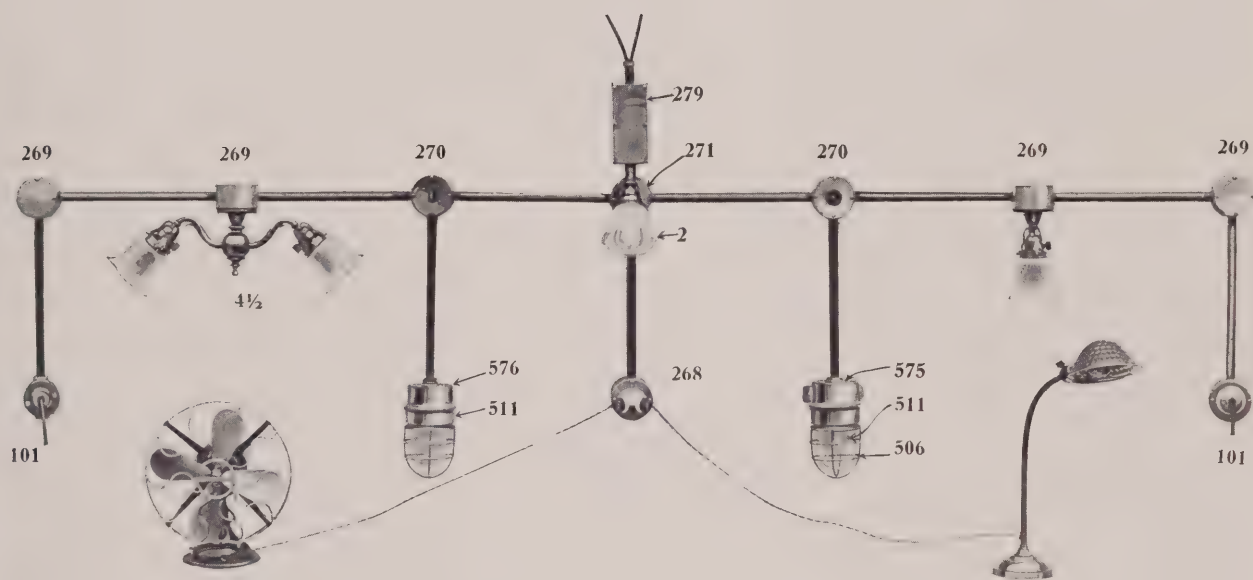
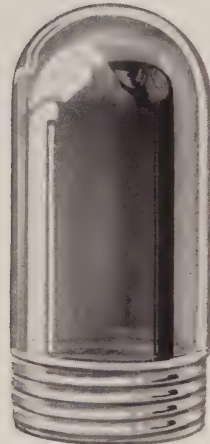


Diagram Showing Application of Conduit Fittings

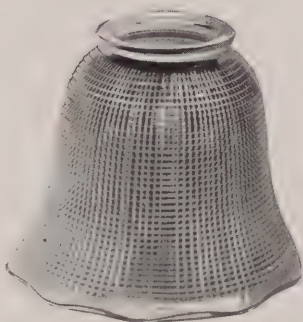
Numbers refer to fittings illustrated between pages 174 and 187.



No. 110



No. 111



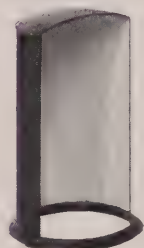
No. 452



No. 453

Globes and Shades

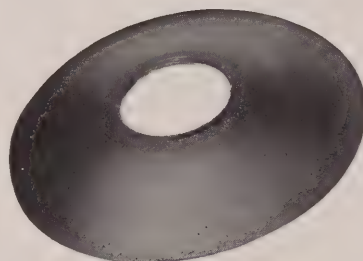
- No. 110. $4\frac{1}{4}$ x 5-inch Vapor Globe, used on Fixture No. 96.
No. 111. $3\frac{3}{8}$ x 7-inch Vapor Globe, used on Fixture Nos. 7, 17, 76, 86, 90, 96, 182, 330 and 376.
No. 452. Prism Glass Shade for Cabin Fixtures.
No. 453. Etched Glass Shade for Cabin Fixtures.



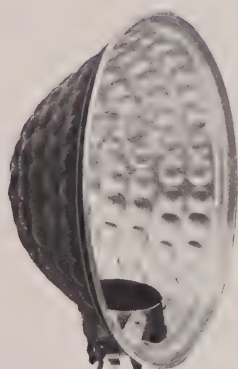
No. 410



No. 420



No. 430



No. 440



No. 6



No. 451

Reflectors and Guards

- No. 410. Metal Half-Reflector for Nos. 76, 96 and 330.
- No. 420. Metal Deep Cone Reflector for Nos. 76, 96 and 330.
- No. 430. Metal Shallow Cone Reflector for Nos. 76, 96 and 330.
- No. 440. Aluminum Reflector for Chart and Desk Lamp.
- No. 451. Green Glass Half-Reflector for Switchboard Bracket.
- No. 6. Guard for Nos. 7, 17, 76, 86, 96, 182, 330 and 376.



No. 196—Cargo Hold Fixture

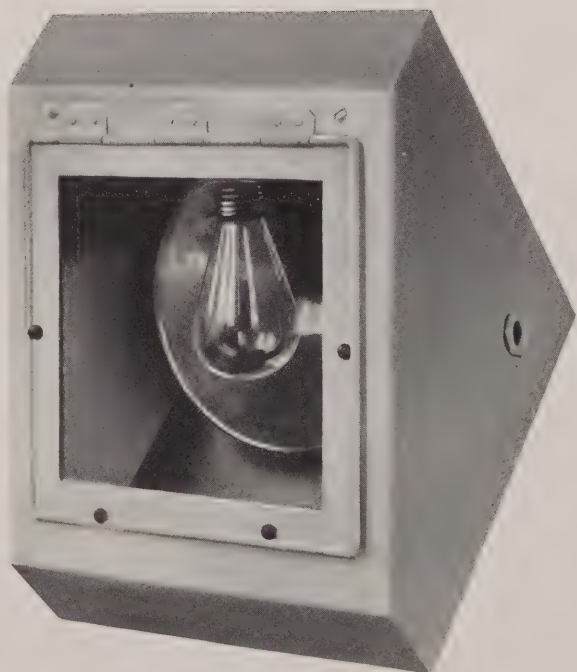
Cargo Hold Fixtures

Spun steel angle reflector. Inside enameled white, outside green.

Vapor-proof glass enclosing globe. Will take 100-watt nitrogen filled Mazda Lamps and smaller sizes.

Cargo Hold Lights

Nickel plated or plain finish. Size, 10 x 10 x 10 inches with $\frac{1}{4}$ -inch glass door. This box is set up under the deck near the ship's side, with the glass door at an angle reflecting the light downward into the hold.



Cargo Hold Fixture (Dust-Proof)

No. 197—Brass Box



Cabin Fixtures

No. 2—One-Light Bracket

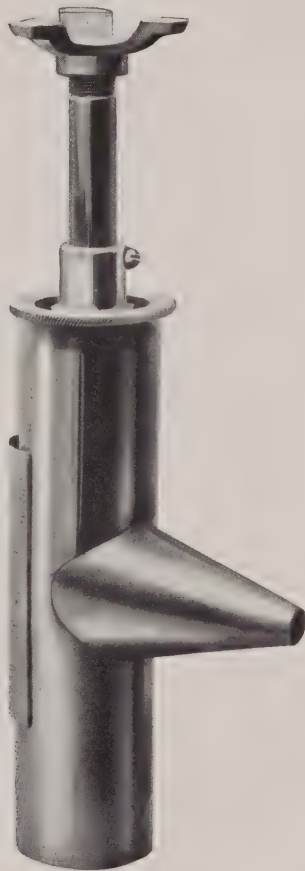


No. 360—Ceiling Pendant

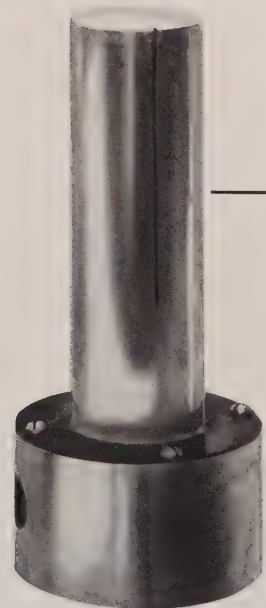
No. 361—One-Light Bracket



These fixtures will fit Universal Junction Boxes Nos. 168, 169, 170, 171, 268, 269, 270 and 271, and Oak Rosette No. 23



No. 14—Binnacle Lamp
Brass—Nickle Plated



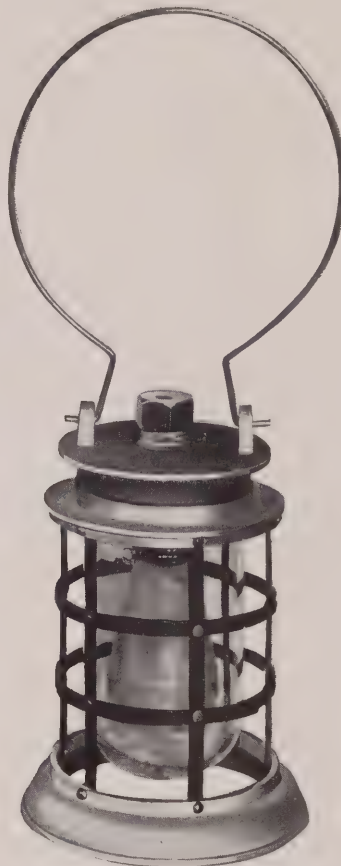
No. 12—Stack Light Fixture
Composed of
Fittings Nos. 168 and 355
Brass

Binnacle and Range Lights

The wire is connected to No. 168 and the globe is concealed inside of fitting No. 355, the only light that appears coming through the narrow slot. One of these is placed each side of the stack with the slots facing forward, so as to give the wheelsman his range.



No. 7
Consisting of
No. 76 Aluminum Fixture,
No. 99 Plug or No. 100
Casing, No. 6 Guard and
No. 111 Vapor Globe.
Hardwood Handle and 25
feet of Deck Cable.

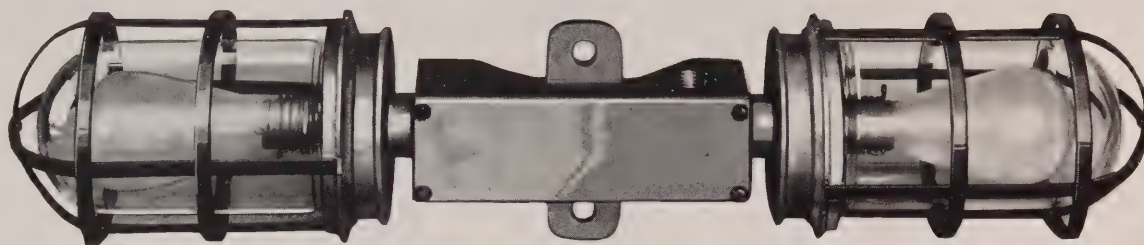


No. 90
Consisting of
Aluminum Lantern Body and Steel
Guard. No. 111 Vapor Globe,
No. 99 Plug or No. 100 Casing and
75 feet of Deck Cable.

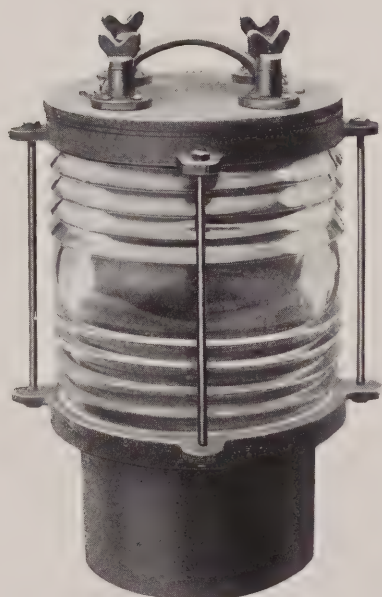
Portables

No. 7. Hand Portable Lamp, for use in inaccessible places where continuous light is required for short periods of times, as in making repairs in engine and boiler rooms, holds, etc.

No. 90. Hand Lamp, for use outside ship as in hanging over bow and stern for reading load lines, propeller blade setting, etc.



No. 17
Consisting of Aluminum Spar Box, two No. 76 Fixtures, two
No. 111 Vapor Globes and No. 6 Guards.



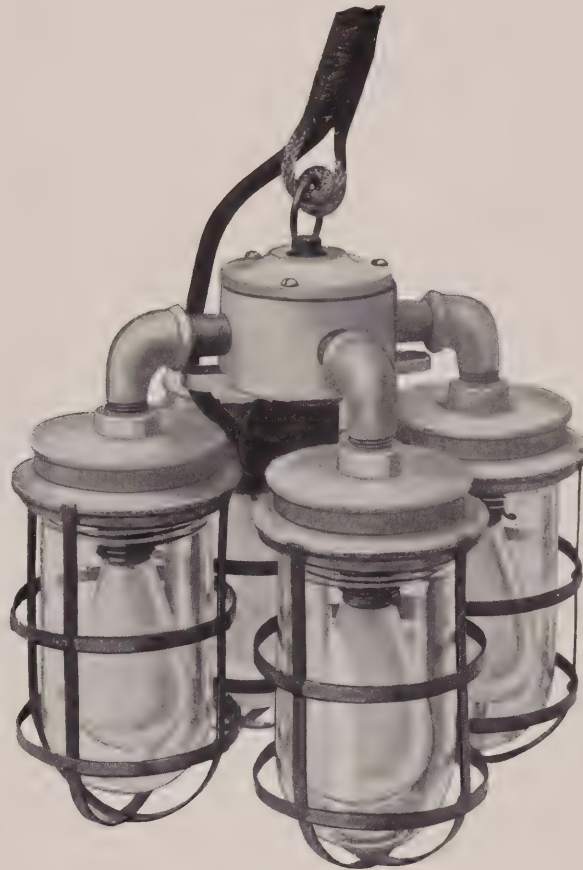
No. 517
Brass



No. 376
Brass

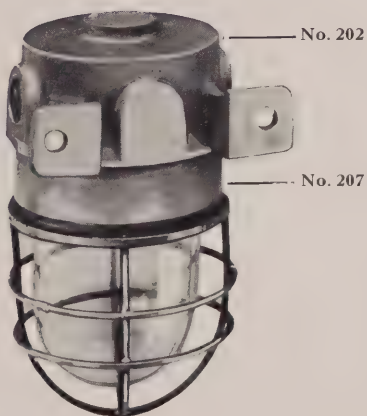
Range and Bulkhead Lights

- No. 17. Range Light for Lake Steamers.
No. 517. Truck or Range Light for Salt Water Steamers.
No. 376. Bulkhead Fixture complete, consisting of Nos. 168, 330, 6 and 111.

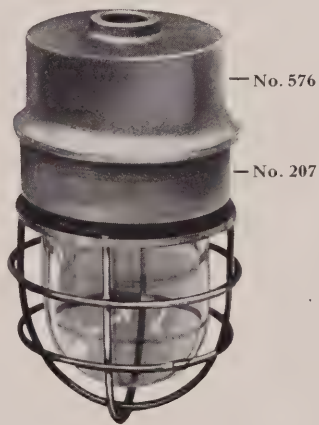


No. 182

Consisting of one No. 171 Junction Box, four No. 96 Fixtures, four No. 6 Guards, four No. 111 Vapor Globes, No. 99 Plug or No. 100 Casing and 50 feet of Deck Cable.



No. 575
Brass



No. 576
Brass



No. 577
Brass

Miscellaneous Fixtures

- No. 506. Guard.
- No. 511. Gas-Tight Globe.
- No. 182. Four-Light Deck Cluster.
- No. 575. Gas-Tight Bulkhead Fixture for Oil Boats, Gas Works, Paint Works, etc.
- No. 576. Gas-Tight Pendant Fixture.
- No. 577. Gas-Tight Angle Iron Fixture.



No. 168 Plug Box

Standard Round Plug Boxes

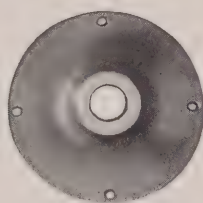
Universal Junction and Outlet Box. Made in iron and brass. This is without doubt the "roomiest" box on the market. It is 4 inches in diameter and 2¼ inches deep. It will accommodate any of the fittings enumerated below, and still leave ample space for taps and splices.

Fittings for Universal Junction Box

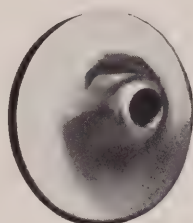
- | | |
|--|--|
| No. 2. 1-Light Bracket (Page 177). | No. 320. 1-Light Close Bracket (Page 183). |
| No. 12. Stack Light (Page 178). | No. 322. 2-Light Close Brackets (Page 183). |
| No. 96. Hold Fixture (Page 187). | No. 330. Water-Tight Bulkhead Fixture (Pages 180-187). |
| No. 300. Blank Lid (Page 183). | No. 340. Indicating Snap Switch (Page 183). |
| No. 301. Lid, tapped for ½-inch Pipe (Page 183). | No. 350. Receptacle for Screw Attaching Plug (Page 183). |
| No. 302. Pendant Lid, tapped for ½-inch Pipe (Page 183). | No. 360. Ceiling Pendant (Page 177). |
| No. 310. Plug Box Fitting (Pages 180-183). | No. 361. 1-Light Bracket (Page 177). |
| No. 316. Bulkhead Fixture (Page 180). | |

BRASS No. 268	BRASS No. 269	BRASS No. 269	BRASS No. 270	BRASS No. 271
IRON No. 168	IRON No. 169	IRON No. 169	IRON No. 170	IRON No. 171
ONE OUTLET	TWO OUTLETS	TWO OUTLETS	THREE OUTLETS	FOUR OUTLETS

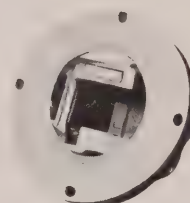
Use above table to designate position and size of outlets. Brass Boxes and Fittings are finished in polished, brushed or oxidized brass, marine black or nickel.



No. 301
Iron



No. 302
Brass

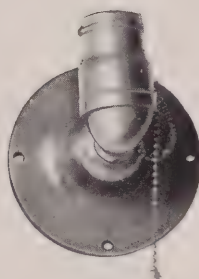


No. 310
Brass

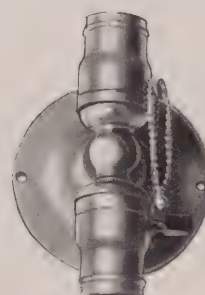
No. 300. Blank Lid
Same Otherwise as No. 301



No. 312
Aluminum



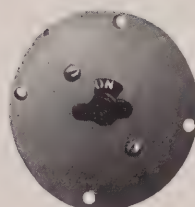
No. 320
Brass



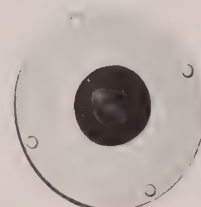
No. 322
Brass



No. 330
Brass



No. 340
Brass



No. 350
Brass

Miscellaneous Conduit Fittings

- No. 300. Lid (Blank), not shown.
No. 301. Lid, tapped for $\frac{1}{2}$ -inch Pipe Thread.
No. 302. Pendant Lid, tapped for $\frac{1}{2}$ -inch Pipe Thread.
No. 310. Fitting to make Plug Box No. 101.

- No. 312. Screw Cap for No. 310.
No. 320. One-Light Wall Bracket.
No. 322. Two-Light Wall Bracket.
No. 330. Water-Tight Bulkhead Fixture.
No. 340. Snap Switch Fitting.
No. 350. Receptacle Fitting.



No.
68138



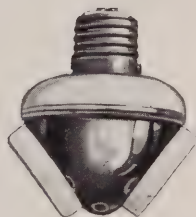
No. 59483



No. 4481



No.
65281



No. 900



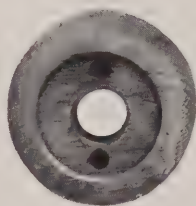
No. 63137



No. 903



No. 4486



No. 21



No. 23



No. 22

Miscellaneous Cabin Fixtures

- | | | | |
|-----------|--|------------|--|
| No. 900. | Multiple Attaching Plugs. | No. 59483. | Keyless Marine Socket, $\frac{3}{8}$ -inch Cap. |
| No. 903. | Single Attaching Plugs. | No. 63137. | Keyless Marine Wall Receptacle. |
| No. 4481. | Key Marine Socket, $\frac{3}{8}$ -inch Cap. | No. 65281. | Chain-Pull Marine Socket, $\frac{3}{8}$ -inch Cap. |
| No. 4486. | Key Marine Wall Receptacle. | No. 68138. | Chain-Pull Marine Wall Receptacle. |
| No. 21. | Oak Rosette, for supporting Wall Receptacles Nos. 4486, 63137 and 68138. | | |
| No. 22. | Oak Rosette, for supporting Snap Switch. | | |
| No. 23. | Oak Rosette, for supporting Fixtures Nos. 2, 4, $4\frac{1}{2}$, 96, 360, 361, 362, 320 and 322. | | |

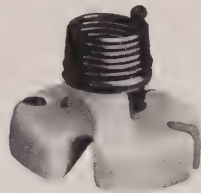
These Rosettes are not necessary when cabin wires are run in conduit. All conduit fixtures are interchangeable and will fit Nos. 168, 169, 170 and 171.



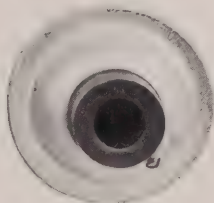
No. 25
Wrought Iron Pipe Hook



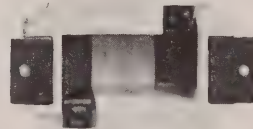
No. 99



No. 22287



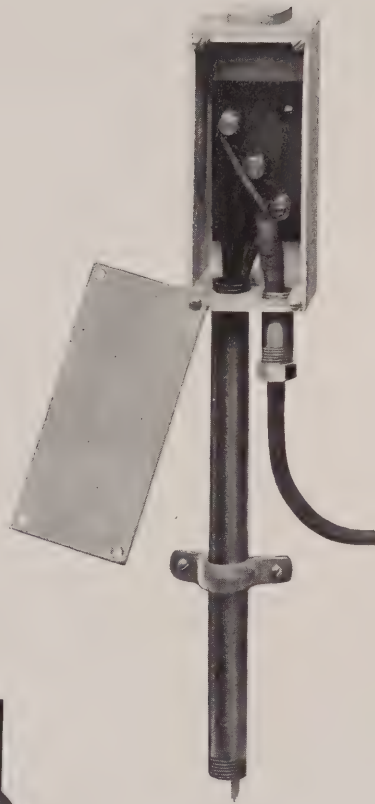
No. 100
Aluminum



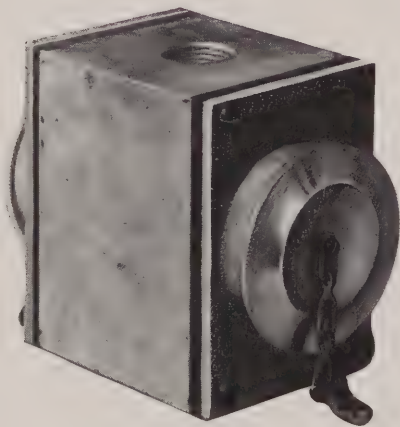
No. 281

Miscellaneous Parts

- No. 25. Pipe Hook for Fastening Cable to Bulkheads, Etc.
- No. 99. Fusible Plug for Portables.
- No. 100. Water-Tight Plug Casing.
- No. 281. Porcelain Receptacle used in Nos. 101 and 175.
- No. 22287. Spring Receptacle for Fixtures Nos. 7, 17, 76, 86, 90, 96, 182, 196, 330, 376, 575, 576 and 577.



No. 103
Iron



No. 175
Aluminum



No. 179

Conduit Fittings

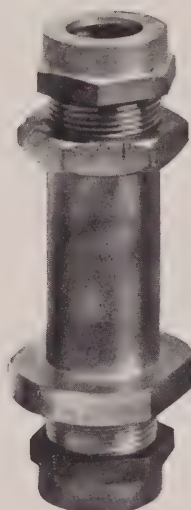
- No. 103. Plug Box—Three-Wire.
No. 175. Double Deck Receptacle.
No. 179. Iron Pull Box.



No. 86
Aluminum



No. 96
Consisting of
No. 76 Fixture,
One Street Ell,
One 2-inch Nipple and
No. 301 Lid



No. 534
Brass



No. 533
Brass



No. 76
Aluminum

Conduit Fittings

- No. 76. Engine Room Fixture, used also on Nos. 7, 17, 96 and 182.
- No. 86. Car Ferry Fixture.
- No. 96. Hold Fixture.
- No. 533. $\frac{1}{2}$ -inch Deck Stuffing Tube. (Standard Oil Co. Type.)
- No. 534. $\frac{3}{4}$ -inch Deck Stuffing Tube. (Standard Oil Co. Type.)



The "Kirby" State Room Bracket and Socket

No. 359 Brass

No. 360 Nickel Plated

A one-piece cast brass electric fixture for use in state rooms or cabins, easily installed. Length, 4½ inches; width of flange, 3 inches.



The "Kirby" Panel Fixture

No. 386

Flange, 5 in. diameter

Bulb, $2\frac{5}{16}$ in. diameter

This fixture is fitted with brass flange. Especially designed for ceiling or cabin panel installation. Flanges of different sizes may be furnished.



Index

A		E	
	Page		Page
Alcoves, Drinking.....	143	Engine—Cargo Hoisting.....	66
Allegheny, Steamer.....	20	Compound.....	62
		Fan.....	65
		Steamer City of Grand Rapids.....	61
		Steamer Comet.....	63
		Steamer Noronic.....	58
		Steamer Seeandbee.....	41-42-43-44
		Steamer W. Grant Morden.....	60
		Steam Yacht Comanche.....	64
		Quadruple Expansion.....	59
		Escutcheons.....	131
		F	
		Fairleader.....	152
		Farrell, Steamer James A.....	23
		Favorite, Tug.....	22
		Fittings, Application of Electric.....	173
		Fittings, Flanged.....	96
		Fixtures—Cabin.....	177-184-188-189
		Conduit.....	183-186-87
		Electric Hold.....	176
		Miscellaneous.....	181
		Flagpoles.....	98
		Forgings, Engine.....	67
		Forgings, Ship.....	68-69
		G	
		Gauge, Water.....	151
		Globes, Electric.....	174
		Gongs.....	148
		Grate Bars.....	99
		Guards, Lamp.....	175
		H	
		Handles, Berth and Sash.....	141
		Hanna, Jr., Steamer Howard M.....	24
		Holder, Comb and Brush.....	136
		Holder, Pitcher.....	136
		Holder, Tumbler.....	135-136
		Hook, Hammock.....	141
		Hooks, Coat and Hat.....	137
		Hooks, Door.....	138
		Horne, Tug J. T.....	29
		I	
		Indicators, Ship and Engine.....	154-155
		Indicators, Ship Trim.....	148
		Iselin, Steamer Adrian.....	25
		Isherwood System.....	36-37-38
B			
Baker, Steamer Geo. F.....	23		
Batteries.....	170		
Bell Pulls.....	145-146		
Bells, Electric.....	170		
Binnacle Light.....	178		
Boiler—Donkey.....	52-53		
Firebox Type.....	50-51		
Steamer Brownell.....	54-55		
Steamer Farrell.....	56		
Steamer Noronic.....	49		
Steamer Seeandbee.....	46-47		
Tubular Type.....	57		
Bolts, Slide.....	139-140		
Buffington, Steamer Eugene J.....	23		
Bulkhead Light.....	180		
Bumpers, Door.....	142		
Butts.....	132-133-134		
C			
Calcite, Steamer.....	21		
Capstan Engine.....	77		
Capstans.....	78		
Chautauquan, Steamer.....	32		
Chock, Line.....	106-107		
Chock, Towing.....	105		
City of Detroit III, Interior.....	11-12-13-14		
City of Detroit III, Steamer.....	10		
City of Grand Rapids, Steamer.....	16		
Clusters, Electric.....	181		
Cocks, Drain and Stop.....	149		
Cocks, Indicator.....	150		
Columbia, Steamer.....	18		
Comanche, Steam Yacht.....	35		
Comet, Steamer.....	26-27		
Crane, Deck.....	71		
Cylinders, Lovekin Patent.....	70		
Cylinders, Steamer Seeandbee.....	48		
D			
Davit Stay Release.....	140		
Deck Engines.....	90-91-92-93-94		
Door Fasteners.....	140		
Dope Cups.....	158-159		
Drill Boat No. 1.....	33		
Duluth, Steamer.....	20		



K	Page
Kelley Island, Steamer	21
Knobs, Fancy Door	130

L	
Lamps, Electric	171
Lamps, Oil	144
Launching Views	39-40
Life Boats	161-162
Life Rafts	160
Locks, Kirby Door	120 to 129
Lockers	112
Louisville, Tug	30

M	
Manholes	104
Marquette & Bessemer No. 1, Steamer	19
McGonagle, Steamer W. A.	22
Morden, Steamer W. Grant	24

N	
Name Plates	143
Nasookin, Steamer	17
Niagara Frontier, Steamer	32
Noronic, Steamer	17
Northwest, Steamer	18

O	
Octorara, Steamer	16

P	
Paddle Wheels, Steamer Seeandbee	45
Panel Boards, Distributing	169
Pans, Spelter, Lead and Galvanizing	105-106
Parts, Miscellaneous Electric	185
Passage Light	100
Pellett, Barge James H.	33
Pere Marquette No. 17, Steamer	19
Pipes	97
Pittsburgh, Steamer	31
Plug Boxes	182
Plugs, Fusible and Bailing	153
Portable Lights	179
Port Lights	101-102
Propeller Wheels	95
Pump, Edwards Patent	72
Pumps, Oil	156-157
Put-In-Bay, Steamer	15

R	
Racks, Towel	135
Radiator Shields	114
Range Light	178-180
Reflectors, Electric	175

R	Page
Relay for Whistle	167
Renown, Steamer	28
Revenue Cutter	34
Rochester, Steamer	16

S	
Sanders, Tug W. B.	30
Sash Lifts and Catch	138-139
Scuttles	104
Seeandbee, Steamer	8-9
Shades, Electric	174
Sharples, Steamer John	25
Sheaves	108-152
Shutters, Storm	103
Signs, General Alarm	170
Smoke Stacks	109
S. O. Co. No. 88, Barge	28
Squirt Can	157
Steering Engine, Direct Acting	80-81-82-83
Steering Engine, Internal Gear	84-85-86
Steering Wheels	88
Switchboard, Steamer City of Detroit III	165
Switchboard, Steamer Neptune	166
Switchboard, Steamer Seeandbee	164

T	
Tanks	110
Tanks, Lifeboat	113
Tanks, Oil	157
Tashmoo, Steamer	15
Telephones	170
Telltale, Pilot House	169
The Harvester, Steamer	24
Timberheads	107
Try Cocks	151

V	
Valve, Whistle	150
Ventilators	111

W	
Wadena, Steam Yacht	34
Wallace, Steamer Robert	25
Western States, Steamer	10
West Shore, Steamer	31
Wheelstands	87
Whistle Pulls	145-146
Whistles	147
Wilmot, Steamer R. W.	29
Windlass, Globe	75
Windlass, Special Type	76
Windlass, Spur Geared	74



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